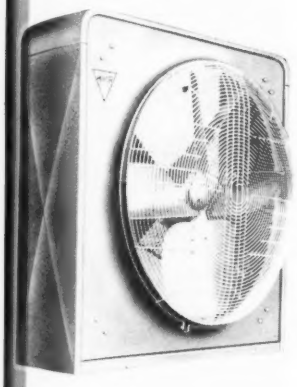
AUGUST, 1940

ELECTRICAL SOUTH



THE 53rd season of HUNTER is soon coming to its close with a record for diversified sales not previously accomplished.

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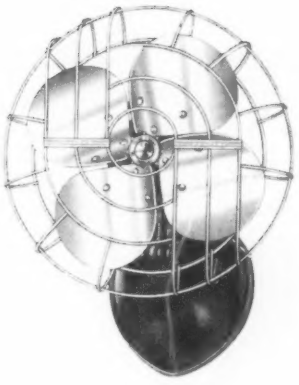

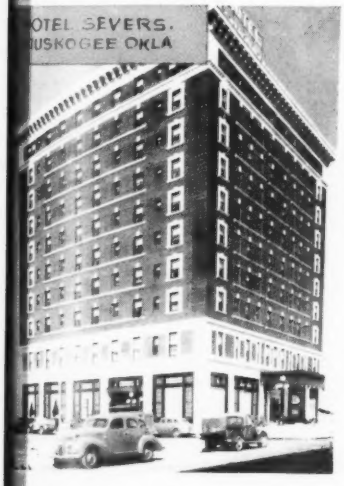

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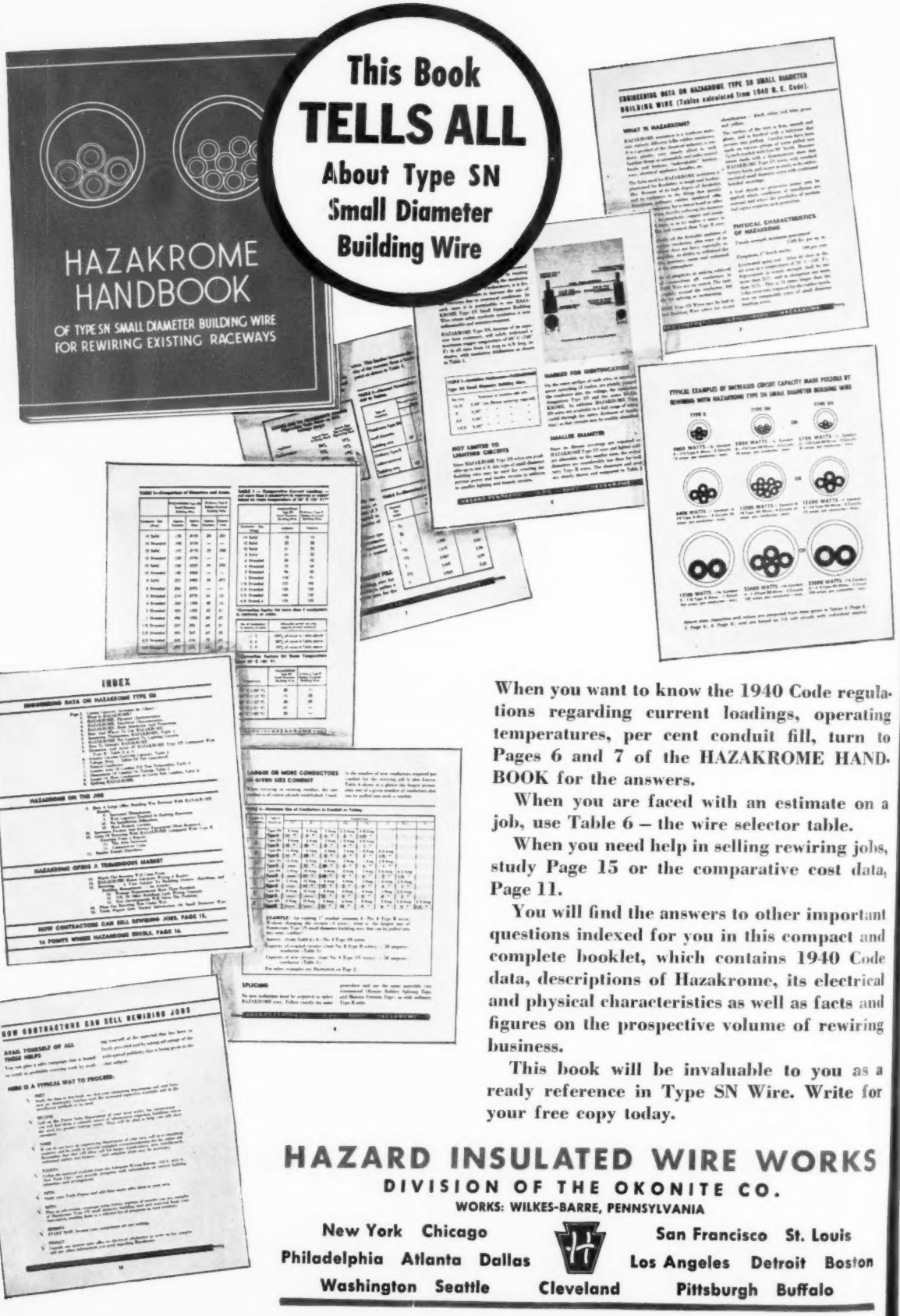

When you want to know the 1940 Code regulations regarding current loadings, operating temperatures, per cent conduit fill, turn to Pages 6 and 7 of the HAZAKROME HANDBOOK for the answers.

When you are faced with an estimate on a job, use Table 6 – the wire selector table.

When you need help in selling rewiring jobs, study Page 15 or the comparative cost data, Page 11.

You will find the answers to other important questions indexed for you in this compact and complete booklet, which contains 1940 Code data, descriptions of Hazakrome, its electrical and physical characteristics as well as facts and figures on the prospective volume of rewiring business.

This book will be invaluable to you as a ready reference in Type SN Wire. Write for your free copy today.

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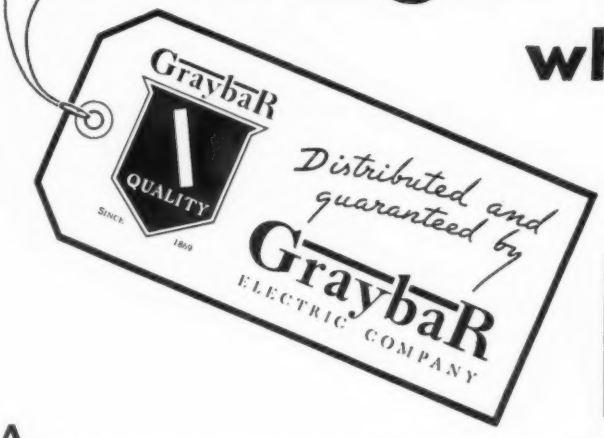

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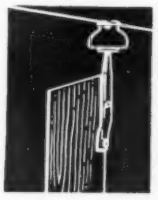
What's more, when GRAYBAR is the supply source, you get experienced buying assistance from men who know "the whole picture." *One call brings them all* when the order goes to GRAYBAR.

POLES



National Western Red and Northern White Cedar Poles – Butt-treatment by Permex incising and impregnating method adds to the natural long life characteristics of these poles. *International Creosoted Pine Poles* – Clear straight poles, meeting high ASA standards, treated by a scientific creosoting process.

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Thomas "Quiet-Type" Porcelain Insulators feature patented under-glaze oxide coating which ends the problem of insulator radio noise effects. Long service life is assured by advanced thermal, electrical, mechanical characteristics. GRAYBAR offers complete line – check coupon for "Quiet-Type" Insulator Booklet.

CONDUCTORS

Among modern conductors for rural distribution service, Crapo HTC-130 sets a new high in providing a ferrous wire with maximum tensile strength and minimum electrical resistance. Available in both solid and 3-strand. Write GRAYBAR for folder on HTC-130 and other Crapo galvanized wire and strand.

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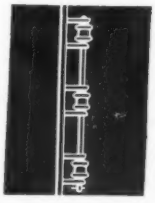
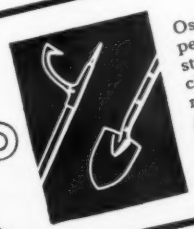


The complete Hubbard line of pole line hardware includes pole top pins, racks, wire holders, insulator bolts and devices specifically designed for low-cost rural lines. GRAYBAR specialists will help you choose approved items for every type of service combining security of performance and low-cost. Mail coupon for details.

TOOLS



Oshkosh shovels, spoons, diggers, peavies, pike poles and other construction tools are built by specialists in meeting utility field needs – offering the *lowest cost per unit of work*. GRAYBAR offers experienced aid in choosing construction and maintenance tools, linemen's safety equipment and supplies. Just mail coupon.

"1 will get you 5" . . . Mail coupon for information on any or all of these services.

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Graybar Electric Company
Graybar Building, New York City

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Please send me information on the subjects checked below:

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2. Thomas "Quiet-Type" Insulators ☐
3. Crapo HTC-130 Steel Conductor ☐
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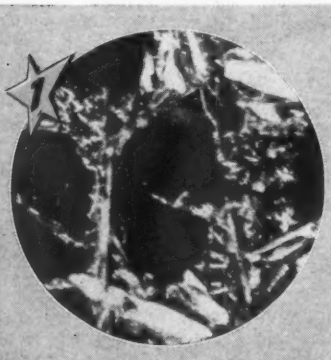

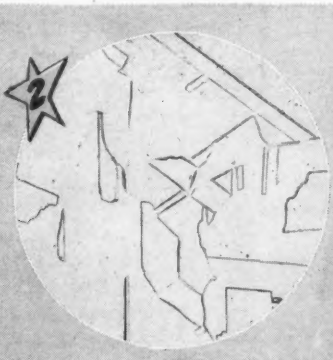

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AUGUST, 1940

Volume 20 No. 8

ELECTRICAL SOUTH

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RICHARD P. SMITH, Promotion Manager
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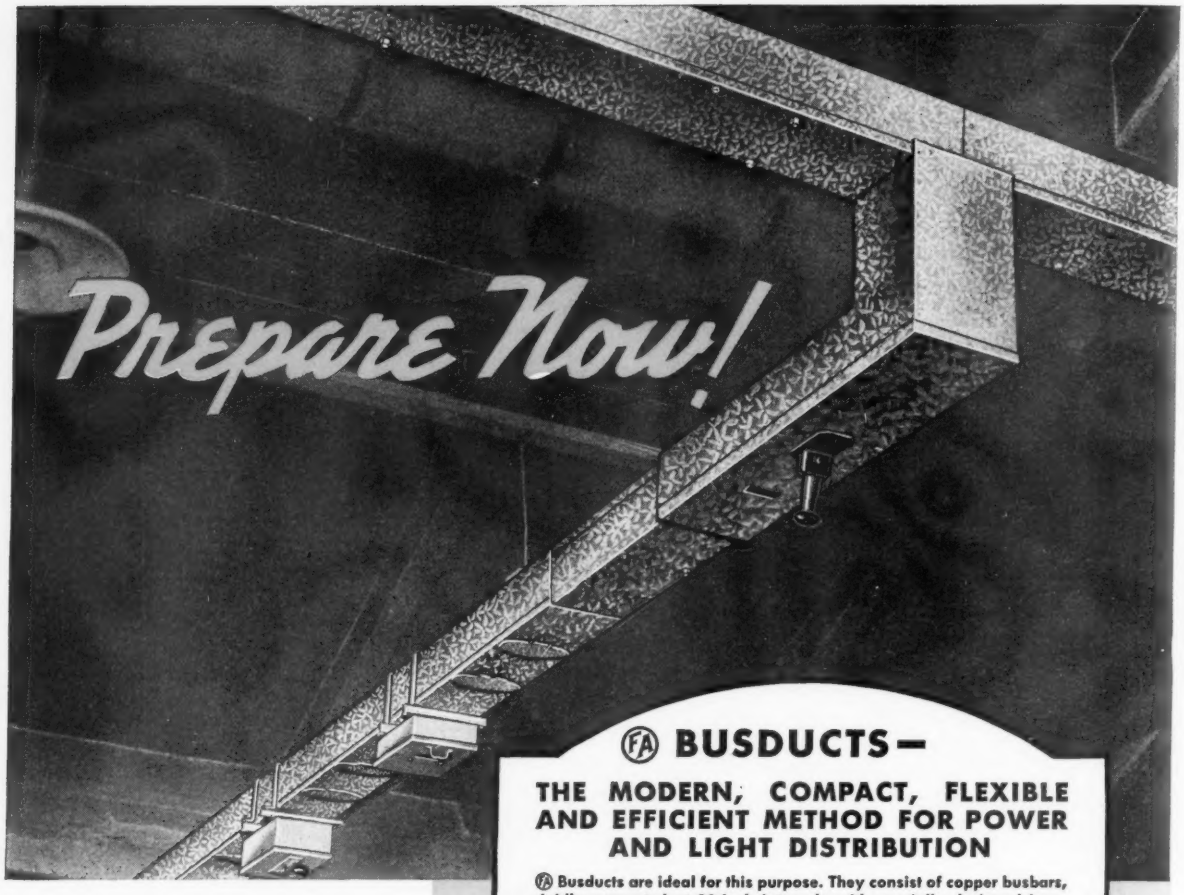

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(FA) Busducts are ideal for this purpose. They consist of copper busbars, rigidly supported at 30-inch intervals with specially designed insulators that assure proper spacing (to meet requirements of the National Electrical Code)—all contained in enclosures of galvanized steel or aluminum. Contact surfaces of connecting bars are silver-plated to prevent oxidation.

All (FA) Busducts are made in standard 10-foot sections. Each section of the Plugin Type is arranged with nine plugin outlets on 12-inch centers; 2, 3 and 4 wire feeder systems; 250 volt DC, 575 volt AC, maximum.

(FA) Busducts can be attached to either walls or ceilings. Flexibility of installation is provided by suitable elbows, tees, end boxes, intermediate feed-in and feed-out boxes—all adapted to fit required space or position. Future extensions may be made readily to existing installations.

With this convenient arrangement, machines may be set or moved at will, and plugged in at any required position without delay.

(FA) Sales-Engineers Can Help You With Your Distribution Problems

Their long experience and training are at your service—without obligation, of course. Write or wire for the name and address of the one nearest you. You'll find him ready to consult with you and help lighten your load. . . . Frank Adam Electric Company, St. Louis, Mo.

DEFENSE ECONOMY will make heavy demands on all of us. New industries must be created—old ones must be revamped—to produce a new and varied line of products. To meet these demands, power and light distribution in every plant must be as perfect as possible. Wiring systems must be modernized so that production may not be impeded. Efficient and dependable busducts—switchboards—panelboards—safety switches—and other electrical equipment will be required for this purpose.

(FA) Products are in a strong position to meet these requirements. Nearly fifty years of development and production assure you of equipment *made better than necessary.* In these products, moderate first cost is combined with low upkeep. In new and modernized plants, these (FA) products will serve faithfully and well:

Feeder Busducts . . . Plugin Busducts . . . Shutlbrak Safety Switches . . . Power and Light Distribution Panelboards (Standard and Column Types) . . . Klampswitchfuz Narrow Distribution Panelboards (for floor and wall mounting) . . . and many others.

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Frank Adam

ELECTRICAL PRODUCTS

for Industry

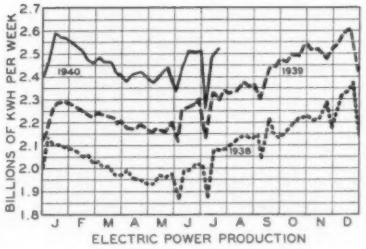
FRANK ADAM ELECTRIC CO.
ST. LOUIS, MO. U.S.A.

Electrical Business Trends

MAY sales statistics for the electrical industry continued favorable. The forward movement in unit sales of household refrigerators continued in May and reached a new high. In the 16 southern states, unit sales in May totaled 85,826, an increase of 61% over sales in May, 1939. National sales totaled 385,688, an increase of approximately 41%. Greatest increase in refrigerator sales was recorded in the West South Central states of Arkansas, Louisiana, Oklahoma and Texas—an increase of 75%.

Major appliance sales, not including refrigerators, also moved upward but were still short of the 1940 high established in March. Range sales are an important factor in this index. National sales totaled 46,518 and represented an increase of 34% over the same month of 1939. For the 16 southern states the percentage increase in range sales over May, 1939, was 48%.

In the industrial electrical field new highs were established in May. Orders for motors and generators rose above the previously recorded high for 1940 in March. Orders received for transmission and distribution equipment rose to the highest point yet achieved this year and sales of industrial materials continued at about their March and April levels.



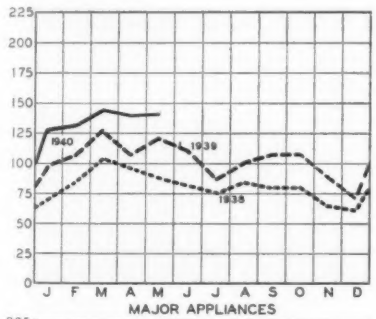
ELECTRIC POWER PRODUCTION

Per Cent Changes 1940 Over 1939	Week Ending July 20	Week Ending July 13
New England	+ 5.4	+ 3.1
Middle Atlantic	+ 9.6	+ 5.2
Central Industrial	+16.8	+12.1
West Central	+ 3.9	+ 0.6
Southern States	+ 6.5	+ 2.6
Rocky Mountain	+18.1	+21.6
Pacific Coast	+ 4.4	+ 5.3
Total	+10.0	+ 6.8

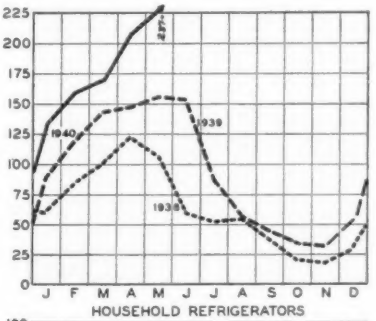
Sales of electrical wholesalers for May, 1940, in comparison with sales for May, 1937, showed an increase of 17.3%. As might be expected, the substantial increases in household appliance sales of the past few months in the southern states, as well as continued activity in the building trades in these states, has resulted in increased sales among the electrical wholesalers. The largest increase was in the East South Central states where sales were up 27.3% in comparison with the same month of 1939. Increase in the West South Central states was 21.3%; and in the South Atlantic states, 18.5%.

In the construction field it was noted that home building under the FHA program was going forward at record breaking levels during May. For the second consecutive month, new home applications for FHA mortgage insurance exceeded $100,000,000. Applications for new homes to be built under FHA inspection show a gain of about 40% in number and 33% in amount over last year.

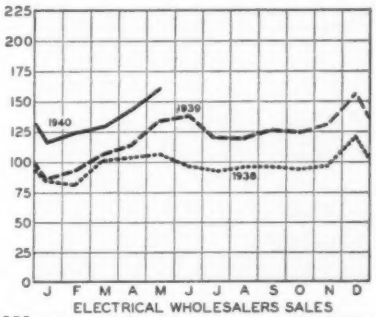
(*Continued on page* 47)



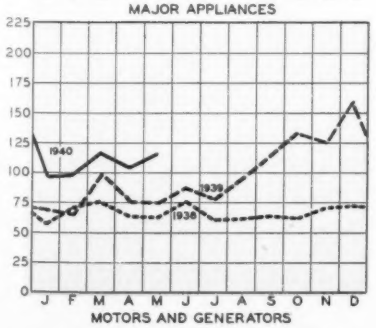
MAJOR APPLIANCES



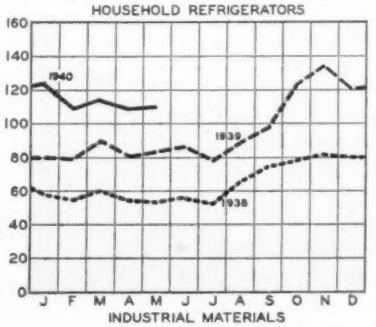
HOUSEHOLD REFRIGERATORS



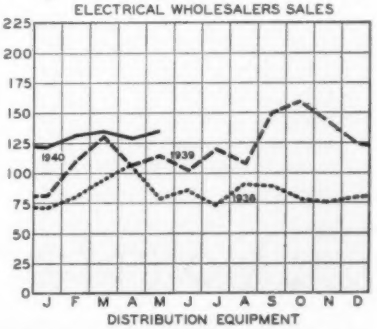
ELECTRICAL WHOLESALERS SALES



MOTORS AND GENERATORS

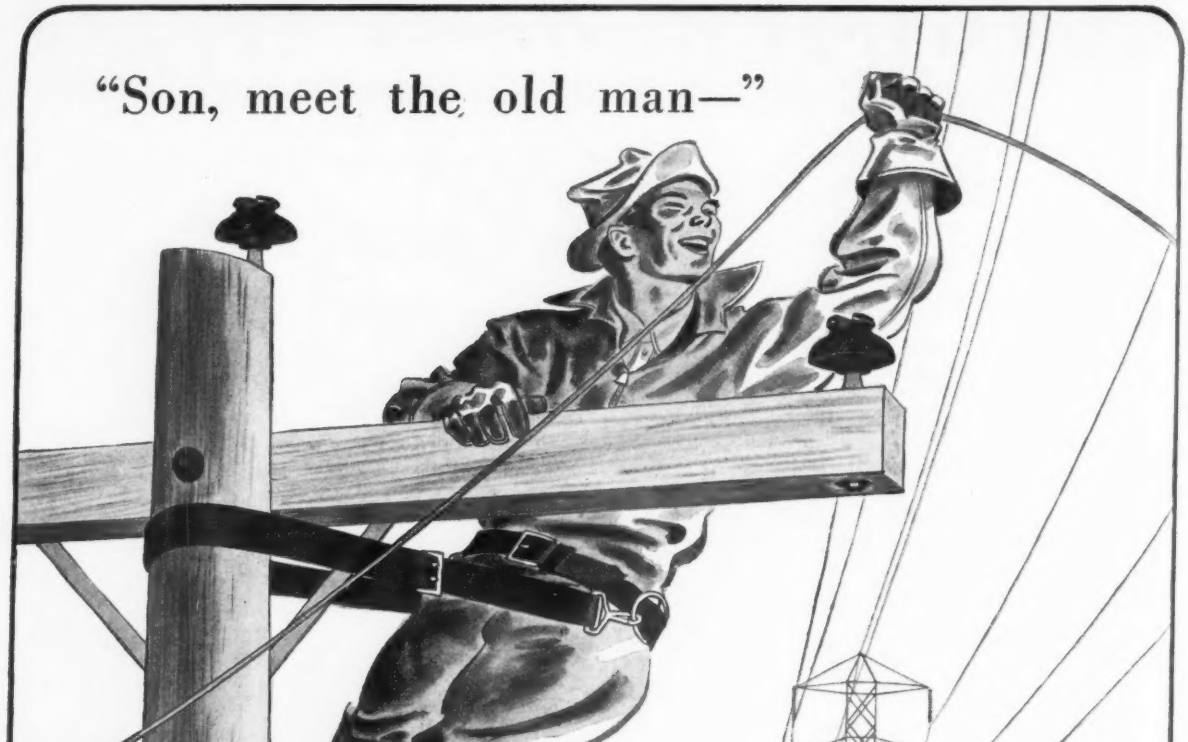


INDUSTRIAL MATERIALS



DISTRIBUTION EQUIPMENT

All of the above indexes of electrical business activity are based on figures available from the National Electrical Manufacturers Association, except the index of electrical wholesalers' sales which is based on data published by the United States Department of Commerce. The indexes on motors and generators and distribution equipment are based on orders received, while the index on industrial materials, including such items as electrical porcelain, mica, vulcanized fiber and laminated products, is based on sales billed. The index on distribution equipment includes such items as high voltage insulators, paper cable, power switching equipment, power distribution transformers, and varnished cambric cable. The index on major appliances does not include refrigeration. The index on household refrigerators includes complete household refrigerators, separate household evaporators, and separate systems of 1/4 horsepower or less. The index on electric power production is based on data released by Edison Electric Institute. 1936 averages taken as 100%.

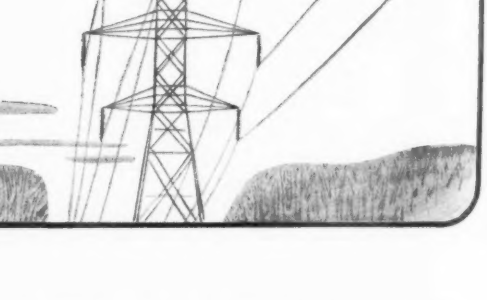


"It ain't often a youngster like you, Rural Line, gets a close-up of an old timer like this A.C.S.R. hi-line. No reason why you shouldn't be neighbors for a l-o-n-g time. You're made of the same stuff."

Operators of A.C.S.R. lines know Aluminum as a highly successful conductor material. Strung according to Alcoa engineering standards, it makes the finest possible construction.

A.C.S.R. provides high strength and durability, permitting low cost, long-lived construction. It has the conductivity necessary for future growth of load. Hi-line or rural line, there's an A.C.S.R. conductor offering the most economical combination of these properties.

ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh, Pennsylvania.



A·C·S·R

Aluminum Cable Steel Reinforced

FOR RURAL LINES AND POWER TRANSMISSION

ELECTRICAL SOUTH

AUGUST, 1940

Tampa Range Sales Program Wins National Recognition

Substituting a year-to-year sales program for spasmodic campaigns, Tampa Electric sets an enviable sales record.

CONSISTENCY in its sales policy won the 1940 George A. Hughes award for the Tampa Electric Company of Tampa, Florida, and gave the company its greatest electric range selling year in history.

The award was presented in national competition for "the greatest contribution to the promotion and sale of electric cookery" by Mr. Hughes, himself, the father of the electric range and chairman of the board of the Edison General Electric Appliance Company, of Chicago. It brought national recognition to a well planned, long range sales program that has been outstanding in its results.

Program is the right word, not campaign, because it extends from year to year, not from week to week, and is built solidly on sales performances of the past with definite continuity.

The company does not conduct intermittent special campaigns. It offers no prizes, bonuses, premiums, discounts or other special inducements. On the other hand, it aggressively merchandises its ranges and other load-building appliances in a manner that brings lasting results.

The greatest single factor in its plan is constant recognition of the viewpoint of customers. Complete customer satisfaction is the basis of all merchandise offered for sale, the manner in which it is sold, and service by the company after the sale.

RESULTS!

The Year 1939: The greatest range selling year in the company's history!

Twenty-one per cent of all the ranges on the company's lines sold in 1939!

	1938	1939	% Increase
Ranges sold by company	807	1,050	30%
Ranges sold by dealers	102	161	58%
TOTAL RANGE SALES	909	1,211	33%

Total number of residential customers as of January 1, 1939 35,637

Total number of range sales in 1939 1,211

3.3% of total customers sold.

28% of definite range market sold.

High lights of Tampa's most successful range selling year are given in this analysis.

First of all, the company analyzed its market. It found that 75 per cent of its residential power customers were using less than 65 kilowatt hours of electricity per month, making electric cooking unprofitable to them. Of the remaining 25 per cent, 13 per cent already were using electric ranges, leaving a definite range market of only 12 per cent of the total.

The merchandising policy, therefore, includes a consistent program of creating a wider range market. This is being done by constantly stepping up the kilowatt-hour consumption in the lower brackets through the combined active efforts of utility and dealer in the sale of electric refrigerators, small appliances, and in the promotion of better lighting. In the past year this plan added two per cent of the total customers to the active range market.

The company took this market and set out to sell 25 per cent of it in a year, meaning a quota of 960 ranges. The objective was divided among 16 outside salesmen, giving each man a quota of five ranges a month or 60 a year.

It was felt that by prorating the year's quota equally into 12 months the salesmen would tend to do a more uniform job, and would not resort to high pressure selling as is often the case during intensive campaigns of short duration. The results of each day's work were reported on the following morning and each man's sales were posted on a progress chart.

Every salesman made his quota, and it is emphasized that they were good salesmen to start with. The company requires that they be good substantial citizens and that they have ability to earn incomes sufficient to give them influential positions in their community. In the last year their average income was $219 a month, not including automobile allowances, and the turn-

Present in Atlantic City to receive the award for their successful electric cookery promotion were (left to right) E. A. Talkington, merchandise manager, Jack Lacey, advertising manager, and M. T. Anthony, sales manager. George A. Hughes, chairman of the board of Edison General Electric Appliance Co., at extreme right, made the presentation personally.

over is negligible. The average length of service of the present group of salesmen is more than seven years.

With these men serving as shock troops on the sales front, the company gave them every possible support, throwing in numerous sales aids behind them. The salesmen were the spearhead of a movement into which the company placed all of its resources.

The salesmen were given exclusive territories, arranged with consideration of the density and class of population so all would have equal opportunities.

They were given a course in range selling provided by the LaSalle Extension University as well as a number of courses supplied by various manufacturers, and were constantly drilled in the new features of electric ranges as they were developed.

In addition to being thoroughly familiar with the construction of the range, the company insists that the salesmen be equally familiar with its use. It conducts a series of salesmen's cooking schools at which the salesmen do actual cooking in the company's "Leisure House" kitchen under supervision of a company home economist. Cooking assignments are given to each salesman on which actual demonstrations and written examinations are conducted.

Sales meetings are held every morning at 8:30 o'clock to arouse enthusiasm for the day, acquainting the men with new products and going over all phases of their work. Group singing at the opening and closing of the meetings has been instrumental in building up a strong morale.

Each salesman turns in a daily report on which is recorded his previous day's work, including names of customers contacted, the type of appliance discussed with customers and the result of each call made. A large progress chart in the meeting room visualizes each man's production.

The company does everything possible to provide new prospects, and one of the most productive methods is a continuous systematic check of meter records to obtain names of customers whose increasing use of electricity makes them practical prospects for electric cookery. These names are given to the salesmen in daily allotments, and they are required to report back on the result of their calls the next morning.

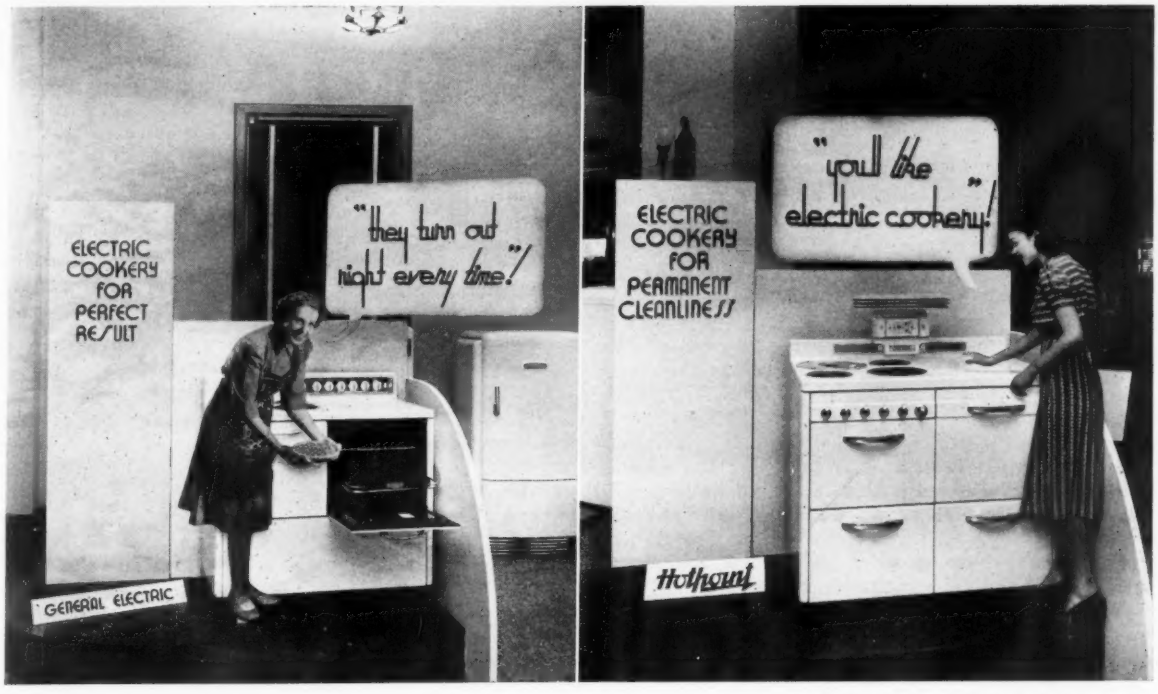
All employees make a consistent effort to provide prospects, and they are paid a bonus of three dollars for each prospect's name which results in a sale within 45 days.

A systematic check is kept on homes wired for electric ranges. As soon as a range user moves out of a house the salesman in that territory is notified and makes a call upon the new occupant. A constant effort is made to keep all range-wired houses active.

The company also is watchful of its contacts with range users. Salesmen are required to make a call-back the day after a range has been installed and then again at regular intervals thereafter. In this manner they obtain many additional prospects from actual users.

Purchasers of refrigerators are logical prospects for the sale of

An important factor in the company's sales promotion program was the favorable publicity received from their organization of "Ancient and Honorable Order of Coqui," a club composed of prominent local men who cook as a hobby, and is open to all men who have a favorite recipe. The men and their recipes were featured in local advertisements.



These window displays designed by Jack Lacey attracted much attention. They featured life-size photographic enlargements, tinted in natural colors, made from publicity photographs of the manufacturer. Many phone calls were received asking if models were Tampa residents!

electric ranges, particularly after they have completed their payments. The company watches this source closely, and as soon as the refrigerator has been paid for, it sends a letter to the customer, thanking him for the business. At the same time the company points out that the use of a refrigerator has brought the customer into the lower brackets of the residential rate and that an electric range would therefore be economical and another step toward a modern all-electric kitchen. Prompt follow-up of this class of prospects produces a considerable part of the company's range sales.

This is the company's staff of home economists who supervise home service activities and the classes and demonstrations in "Leisure House."

Customers attending the company's cooking schools are requested to fill in attendance cards, giving their names and listing the appliances they have, together with others in which they are interested. Many range prospects are found in these cards which are apportioned among the salesmen according to their territories.

The sale of electric roasters is another source of range prospects. When a customer is not entirely sold on the idea of buying an electric range, the company endeavors to place an electric roaster in that home, knowing that it will influence many customers in buying a range by demonstrating the advantages of electric cookery.

If a customer buying a roaster purchases a range within a year, the company permits the amount paid for the roaster to be applied on a range. Roaster owners are canvassed continuously for range sales.

The company also pays particular attention to its own employees as active prospects. It makes electric ranges available to them at 10 per cent above company cost, and of 711 employees of all classes, both white and colored, more than 60 per cent use electric ranges.

All these sales methods are soundly supported by a constant advertising campaign predicated on the principle that the best way to sell is to let the customers do the talking. Advertisements feature testimonials of electric range users, combined with pictures of women customers in their electric kitchens.

On the assumption that men have as much interest in purchases for the home as women the company originated a unique promotion through a men's cooking club, called the "Ancient and Honorable Order of Coqui." This club is composed of men who cook as a hobby and is open to all men who have a favorite recipe.

Memberships are awarded through an "initiation" process in which the man actually cooks his favorite recipe on an electric range, and is photographed so doing. The picture, together with his statement about electric cooking, his recipe and facts about himself, are published in a company advertisement. *(Continued on page 12)*

Dealers Exploit Low Energy Rates

Low rates alone will not greatly increase electrical usage but low rates combined with aggressive merchandising is producing unusual results in Chattanooga.

By Murray Wyche

NOW that the Tennessee Valley Authority has had opportunity to put into widespread operation its program of cheap electric power, leaders in the electrical industry have been much interested in an analysis of the results thus far obtained in this vast governmental experiment.

Particularly have electric appliance dealers and manufacturers, as well as those engaged in load building activities, been anxious to check on the relative effects of the lower power rates in increasing home use of electric ranges, refrigerators and water heaters, irons, washers, radios and the scores of miscellaneous appliances.

These men have also been anxious to know, for instance, whether cheaper power rates will encourage the use of electricity in the heating of homes, a development that has been definitely noted in the Tennessee Valley, and the effect it will have on the installation of smaller air conditioning units in homes and offices.

The question of whether low power rates alone will sell electric appliances, or whether it is aggressive dealer activity that is the biggest factor in boosting sales volume, has long been a matter of conjecture among appliance manufacturers and distributors.

There are those who hold that low rates are essentially necessary for the increased sale and use of appliances. Others are of the opinion that slashed rates alone will not bring about any great increase and that strong promotional programs can boost power usage even with relatively high rates.

The ideal situation of course is where dealer activity and cheap electricity go hand in hand.

In Chattanooga, where the municipality has distributed cheap TVA electric power for several months now, the results of these lowered rates on both distributor and purchaser of electric appliances have had full opportunity to be felt.

On August 15, 1939, the City of Chattanooga, co-operating with the TVA, purchased the generating and distribution facilities of the Tennessee Electric Power Company in Chattanooga, as part of the sale by the utility of its distribution facilities in East and Middle Tennessee.

With the advent of TVA power came a 20 per cent slash in electricity rates in Chattanooga. But this 20 per cent reduction, it was soon found, did not bring an immediate rush to buy electric ranges, refrigerators and water heaters and the monthly volume was up only little despite the savings effected.

Upon entering the electric distribution business, the city had immediately set up the Chattanooga Electric Power Board to handle this phase of its new activity. Calling Chattanooga dealers together, the Board announced that it had no intention of entering the appliance selling field.

Power Board Cooperates

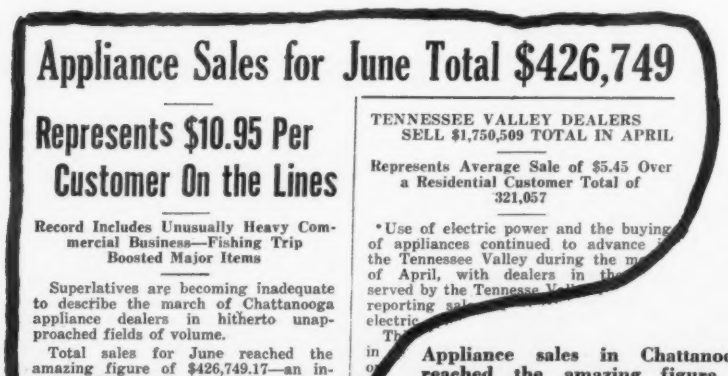
The Board, the dealers were told, rather planned to work with them and aid them in appliances sales. The street floor of the downtown TEPCO building, where Chattanoogans came to pay their light bills, would be turned over to the dealers as a joint showroom where they might display their various brands of appliances without cost and where prospect names would be taken and turned over to them. Furthermore, the Board announced, it would install free all ranges and water heaters sold by local dealers.

A campaign of promotional advertising in daily newspapers and over the radio was announced by the Board along with plans to aid dealers in staging promotional events, appliance shows, demonstrations and contests. C. Bert Osborne, experienced in sales promotions, was brought to Chattanooga to work with the dealers and aid and advise them in the intensive selling of electric appliances.

Previous to the time required by the Power Board in getting this program under way, it was noted, there still had been no "phenomenal" gains in appliance sales in Chattanooga despite the low rates.

It was with the progress made in selling the dealers themselves on the facilities now available and the opportunities for electrical appliance sales, that the volume in Chattanooga began to grow by leaps and bounds.

As dealers awakened to the possibilities and went out to get their share of the new business, the sales



Appliance Sales for June Total $426,749

Represents $10.95 Per Customer On the Lines

Record Includes Unusually Heavy Commercial Business—Fishing Trip Boosted Major Items

Superlatives are becoming inadequate to describe the march of Chattanooga appliance dealers in hitherto unapproached fields of volume.

Total sales for June reached the amazing figure of $426,749.17—an increase of $148,594 over the May record of $278,192.

Roughly speaking, the June total represents $10.95 in sales per customer—

TENNESSEE VALLEY DEALERS SELL $1,750,509 TOTAL IN APRIL

Represents Average Sale of $5.45 Over a Residential Customer Total of 321,057

•Use of electric power and the buying of appliances continued to advance in the Tennessee Valley during the month of April, with dealers in the territory served by the Tennessee Valley Authority reporting sales of electric

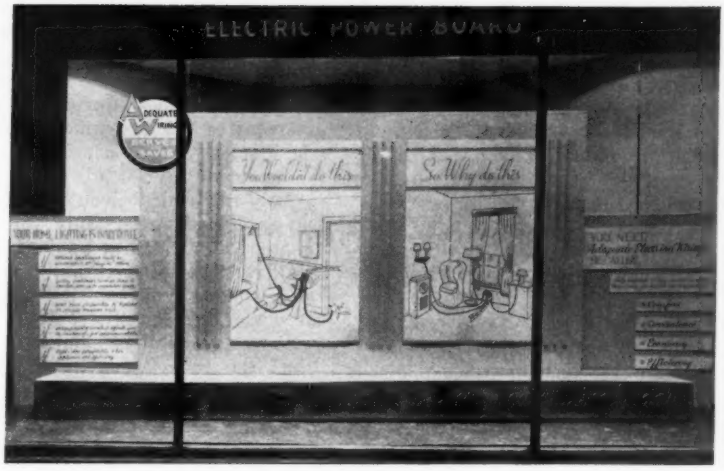
Appliance sales in Chattanooga reached the amazing figure of $426,749 in June, an increase of $148,594 over May. June sales included 795 refrigerators, 421 ranges and 225 water heaters.

of ranges, water heaters and refrigerators gained in Chattanooga. Each month began to show a nice increase over the preceding month but it was not until March, 1940, seven months after the cheap rates had come to Chattanooga, that the record for total monthly sales of electric appliances in this city was broken. And with a live-wire group of dealers now developed, another new record has been set each month since that time.

The new low rate, it was found locally, was helpful in the selling of appliances. But the experience in Chattanooga has been that unless this low rate is followed by aggressive dealer campaigns, it is not fully effective in getting the potential volume.

Electric appliance dealers, it has been found by local experience, must carry on extensive educational campaigns. Salesmen must go into the homes ready to explain to housewives how the new savings in their light bills have been brought about.

In the first few months after the new rates went into effect, and before local dealers became completely organized, it was found that housewives were spending their electric bill savings on something else—a new rug for the parlor or another hat for Sunday.



The Electric League of Chattanooga has been particularly active in promoting adequate wiring. The Electric Power Board cooperated with the league in its campaign by displaying this window exhibit.

Now, due to the educational efforts of Chattanooga appliance salesmen, local housewives are wisely putting their savings back into their kitchens with the purchase of additional appliances and with the resultant additional saving.

Without organized dealer activity, Chattanooga electric leaders firmly believe that the effects of the new and lower power rates alone would have been effective for not more than six months at most in the selling of appliances.

In Chattanooga, where there has developed one of the most progressive and active group of dealers to be found in the Tennessee Valley, the end of the first six month period found monthly sales higher than when the new rates first went into

One of the outstanding electrical promotions in Chattanooga was the "Electric Range Review" sponsored jointly by the Power Board and local appliance dealers. In the large downtown display room, maintained by the Board for the use of the dealers, ranges of every description were on parade as shown above. Home economists were on hand at all times to conduct demonstrations, and special prize promotions brought in hundreds of housewives.

effect. It was in March, seventh month after the reduction, that total sales for one month were broken in Chattanooga. And since that month, a new high has been set in appliance sales every month, in itself proof of the fact that dealer aggressiveness, rather than low rates, is the main factor in selling appliances.

C. Bert Osborne, in charge of power sales promotion for the Chattanooga Electric Power Board, rates the relative weight of low rates and dealer activity as 60 per cent low rates, 40 per cent dealer's efforts. This percentage, he says, applies only at the time rates are first slashed. Every month thereafter brings a shift in emphasis from rates to dealers until as time passes rates are almost forgotten as it is left to the dealer to do the selling.

Chattanooga appliance dealers, who during the month of June sold $426,749 worth of electric appliances, an all-time high for this city, generally were of the opinion that low rates plus dealer activity has been responsible for the spurt in appliance sales here.

John O. Fowler, Sr., president of Fowler Bros., furniture store, says:

"The combination of low rates and aggressive dealers has been responsible for the successful appliance campaigns waged in Chattanooga. The fact that the power company no longer is in competition with us, has encouraged local dealers to step in and do a good job.

"The utility had given longer terms and bigger commissions which private dealers were unable to meet. The Electric Power Board has turned over its entire facilities to dealers and they are 'going to town.' At Fowler Bros., we are unable to keep enough appliances in stock."

Clarence Woods, in charge of the electrical department of the local Sears-Roebuck store, had the following to say:

"Low rates give the dealers the incentive to promote electrical appliances. The Electric Power Board and TVA have educated the people to the savings that can be had from the purchase of additional appliances for their homes. The cooperative advertising and promotional helps have been of much assistance. Dealers are showing much more activity than ever before and this in itself is helping to sell appliances."

During the month of April, Sears electrical department, on three successive Saturdays sold 25 Coldspot refrigerators.

Sidney Marks, of the Tennessee Valley Appliances Company, and president of the Chattanooga Electric Dealers Association, had the following to say:

"Low rates alone won't sell electric appliances. Certainly you get an amount of results by just lowering rates. But it takes both low rates and activity on the part of the dealer to get real results. The two must go hand in hand.

"If the rates were merely lowered and there is no follow up, the consumer would spend the difference on something elce."

J. B. Criswell, of Miller Bros., department store, leading appliance salesman for the month of March, was inclined to give the lower rates credit for Chattanooga's sales record along with the Electric Power Board in awakening public interest in appliances.

Tampa Range Promotion Wins Hughes Award

(*Continued from page* 9)

He is then presented with a certificate of membership, or diploma, which contains his name, his recipe and when he cooked it. The diploma bears the name of the company and is signed by the advertising manager and the hostess of the Leisure House. It hangs in the member's home or place of business as another permanent advertisement for electric cookery.

In addition to its Leisure House program in which the company through its home service division conducts cooking classes for brides, matrons, young girls, servants and other groups of women, a kitchen planning service also is maintained as a part of the sales and service policy. Complete blueprints and color specifications are made available to customers, and the salesmen are thoroughly trained in kitchen layouts.

The company maintains a standard policy of co-operation with electrical dealers and contractors, allowing them liberal commissions on range sales.

For advertising the company uses newspapers, radio, direct mail, billboards, window and floor displays. Where a section of its territory is being developed with groups of new homes, the company uses newspaper advertising to create interest in the development, and at the same time show the increasing acceptance of electric cooking.

It is emphasized that all these methods are a part of a permanent sales program, not merely a temporary drive, and for their use and development the company was given a $500 prize and a silver trophy.

The award was made at the annual convention of the Edison Electric Institute at Atlantic City, and present there to receive it for the company were M. T. Anthony, sales manager, E. A. Talkington, merchandise manager, Jack Lacey, advertising manager, and J. H. Fuller of Winter Haven, Fla., manager of the company's Polk county division.

Help Us to Help You

Dealers asked to cooperate with this publication in its survey of electrical appliance merchandising practice.

ONCE again ELECTRICAL SOUTH turns its editorial spotlight on the activities of electrical appliance dealers. Shortly after August 1, some 2,000 dealers will receive questionnaires asking for information about their business methods for analysis in ELECTRICAL SOUTH'S annual "Survey of Modern Electrical Appliance Merchandising Practice" to be published in the October 1940 issue.

Dealers, as well as wholesale distributors and manufacturers, will find this study of particular interest, since it will indicate trade sentiment on various important problems and trends in appliance merchandising methods. It will enable each dealer to review his own operations in comparison with averages for the trade as a whole as well as with averages for specific groups separated according to type of store and size of city.

Appliance dealers who receive these questionnaires have been selected as composing a typical cross section of dealers in southern states. They range from small dealers operating in rural communities to large dealers in metropolitan areas. They include exclusive appliance specialty stores as well as appliance departments of hardware, furniture, and general department stores. The dealer survey itself will not include reports from appliance stores operated by electric utility companies, but the activities of the utility companies insofar as they relate to the electrical appliance merchandising field will be reported in a separate phase of this survey.

Obviously, the value of a survey of this kind depends upon the extent to which it is representative of the industry and this requires that a considerable number of the questionnaires be returned by dealers in all classifications. Dealers who receive these question blanks are urged to fill them in and return them promptly. Questions have been prepared so that only a minimum of time is required to insert answers. Although the blanks include a space for signature, firm name, city, and state, it is not necessary that the dealer sign the questionnaires if he prefers not to. However, replies to the questionnaires will be held strictly confidential and will be used only in preparing the survey. No mention of any individual firm name or city will be made in the published survey.

New Topics Covered

This year's survey will include several topics not covered last year. For example, dealers will have an opportunity to express their preference in the matter of number of models and range of prices.

Other topics to be covered in the survey include: classification of appliances handled and the degree to which dealers specialize in brands; trade-in practices; service department operations; sales volume from various sources; practice in regard to outside salesmen; credit policies; etc.

The questionnaire directed specifically to sales departments of electric utility companies, the results of which also will be published in the October issue, will disclose practices of these companies affecting appliance merchandisers. This survey will indicate the extent to which these companies are cooperating with independent dealers in their sales activities; the extent to which such companies finance dealer credit sales and collect with light bills; whether free wiring is provided for ranges and water heaters; whether appliance service facilities are made available to dealers; and whether subsidies or bonus payments are made to dealers or their salesmen.

Last years survey disclosed many interesting facts and trends of the appliance merchandising business in the South. Of particular interest was the increasing number of dealers who are stocking and selling complete lines of appliances. The survey indicated that 94% of the dealers replying handled washing machines and that 96% handled ranges. Percentages handling other appliances, as reported, were: refrigerators, 94%; radios, 88%; vacuum cleaners, 82%; small appliances, 78%; and water heaters, 72%. Largest number, 60%, reported the refrigerator as the most profitable appliance, although 44% named the range as one of the most profitable.

In last year's survey, the average margin in per cent of total sales reported by dealers was 34.0%. These same dealers reported an overhead expense of 28.5% of total sales volume, leaving an apparent spread of 5.5% between overhead and gross margin.

Trade sentiment on important problems and trends in appliance merchandising practice will be disclosed in this annual survey. Since its value and effectiveness will depend to a great extent upon the return of a large percentage of the questionnaires mailed out, dealers are urged to fill in the forms and mail them as soon as convenient.

Dramatic Demonstrations Feature Range Campaign

THE MOST intensive drive for electric range and water heater sales ever undertaken by the industry on a national scale is indicated in the announcement by The Modern Kitchen Bureau of its fall programs for these two major appliances. These campaigns will mark a definite advance over any previous program which the Bureau has sponsored and should give a tremendous promotional impetus to the sale of ranges and water heaters.

The Bureau program for electric ranges has as its objective the sale of 100,000 ranges during September, October and November, although the actual campaign period will be from September 15 to November 15. Quotas comprising the 100,000 objective will be suggested to individual utility companies, and a suitable plaque will be awarded to each utility achieving its quota. The general campaign theme will be "Alice in Electric Wonderland."

The central feature of the range campaign will be an hour and a half demonstration which can be staged effectively on the stage of the local theatre, if available. If not, it is completely worthy of the best floor space in the dealer's show rooms. The demonstration is in the form of a dramatic sketch in which the uses of the electric range are emphasized far more forcefully and effectively than in the ordinary cooking demonstration. Plans for this include a full script, a list of necessary stage properties, menus and a list of all food products required for cooking.

The Plan Book for the range campaign outlines the demonstration itself and tells how to promote attendance, suggests suitable attendance prizes, and shows how to obtain dealer cooperation. The program also includes newspaper sections, and publicity and advertising mats to assist local newspapers in selling supporting advertising. A series of radio spot announcements is also furnished.

An important part of the range campaign will be window displays, built around a central display piece which the Bureau will distribute. This display piece is an action sign, so arranged that it appears as an ordinary mirror when the light is off, but when it is on, a figure appears of "Alice in Electric Wonderland" discovering modern electric cooking. A further part of this window display will be a series of four display cards which stress the advantage of electric cooking, and five smaller cards, to be placed on the range itself, calling attention respectively to the deep-well cooker, the broiler, the oven, the top heating units and the automatic timer.

Other collateral material will include a series of direct mail folders and letterhead stickers. The na-

(*Continued on page 46*)

Sale of 100,000 ranges in September, October, and November, is the objective of the Modern Kitchen Bureau in its fall range campaign. "Alice in Electrical Wonderland" will be the theme featured in promotional material prepared by the Bureau. An action window display is shown directly above; a water heater display piece is shown at top. Other material available will include counter cards, direct mail pieces and banners.

Western Round-Up Corrals Profits

THE Western Round-up Contest is a stellar example of the elaborate, all-inclusive contest which is designed for a sustained run of several months, and which, by the nature of its make-up, will develop several advantages to the firm staging it beside the production of an incentive for extra effort on the part of the salesman.

The planning of a contest in this bracket is different from the arrangement for the less elaborate, shorter contest, and should be very thorough, since the epense will naturally be greater. Rather than the allocation of a specific budget in any given month's operating expense, the sales manager should distribute the cost over a period of four or six months, according to the contest run, so as to amortize its cost gradually rather than to upset one month's budget.

This doesn't mean that the cost needs to be prohibitive, but not less than $100 should be allocated for a major, long-run contest, and most firms, particularly those employing over eight men, will spend from $200 to $500 in promoting so elaborate a contest. Obviously the contest is best adapted to sales staffs of fair size, from six men up to two dozen. Needless to say, the sales executives of important firms throughout the country would not appropriate this kind of money, and continue to appropriate it year after year for promotions, if it didn't bring back returns in increased sales and efficiency and net profit.

●

IN THIS fifth article on effective and practical sales contests, a plan for a campaign of several months is presented. Designed to sustain interest over a long period, the Western Round-Up Contest offers good possibilities for obtaining extra effort on the part of the salesmen, as well as providing a medium for valuable publicity and "stunts." Other articles in this series have appeared in the February, March, April, and June issues of 1940.

The backbone of the contest is simple: the usual competition of the individual salesman against quota. Quotas should be figured carefully, since, over a period of six months, the ups and downs of seasonal fluctuation will level sales off to a strict average.

The essential intents and aims of the Western Round-up are two: to give the salesmen a really worthwhile prize goal to shoot at; and to sustain interest over a relatively long period of time. If substantial prizes are to be involved, then naturally the contest promoter cannot afford to award them each week or month; this makes it necessary that the entire contest be pointed to a final prize award at the end of the contest. This, in turn, makes it doubly important that the contest be merchandised constantly to the salesmen, that every week bring some new spur to them in contest form, to keep interest from flagging during the long run.

The mechanics of the contest are as follows: the salesmen become cowboys, punching cattle on a ranch. The firm becomes the ranch, of course, the "Bar Nothing," or the "Double Dollar," or some attractive parody on the firm name. The sales manager is the foreman; the proprietor, if not the same as the sales manager, is the ranch boss. Weekly sales are totaled and figured into percentages of quota, as described in previous articles, (See March 1940 issue, page 29; and April 1940 issue, page 14) and each quota "point" earned by each man, that is, each per cent of quota each week, is a "steer" which the cowhand has herded into his corral. In keeping the records, it is important that the total for the contest period be kept up to date, for it is on the final total that the payoff hinges.

In extensive research in sales contest practices, it has been determined that, unless really substantial amounts of money are involved, merchandise prizes appeal more than do cash awards, and further, that the salesmen like to have some choice in the matter of prizes. To this end, it is advisable to make up a contest prize catalogue for an elaborate contest, containing perhaps a hundred different items of all types and price ranges. A large department store will be glad to assist in this job; the contest manager can approach the general manager of the department store, tell him he is going to award one, or two, or three hundred dollars worth of merchandise in his contest.

The store manager will have his department heads submit a selection of a dozen or so items from each department, arranged so as to appeal to a variety of tastes, and to range in price from $1 to $20. (Incidentally, a worthwhile discount can usually be obtained on a blanket purchase of this sort). The store's advertising department will then make up a catalogue, pasting

(*Continued on page* 46)

Fluorescent Light Application In Modernized Tampa Store

By L. H. Houck

ONE of the largest installations of fluorescent lighting in the South has just been completed by Maas Bros. Department Store, Tampa, Forida, where two complete floors of this big six-story store, have been changed over. The new lighting program was part of a remodeling of the entire building which included new fixtures, air conditioning, new Colonial tea room, new fountainette seating more than 200, and two new electric kitchens.

From new full-length glass doors on street entrances which afford full vision of the interior from the sidewalk to the top floor, every department felt the hands of decorators, electricians, painters, architects and engineers as a new dress was built for this pioneer Florida store.

Fluorescent lighting is a feature of the first and second floors and the electrical appliance section on the fifth floor. Refrigerators, electric ranges, ironers, washers, water heaters and other appliances on the fifth floor are displayed along the wall under a small canopy. Daylight fluorescent tubes are concealed above flooding the merchandise with white light.

The Maas Bros. installation of fluorescent lighting includes many interesting and practical innovations in department store display. The entire job was supervised by Maas Bros. own chief engineer, R. L. Meeks.

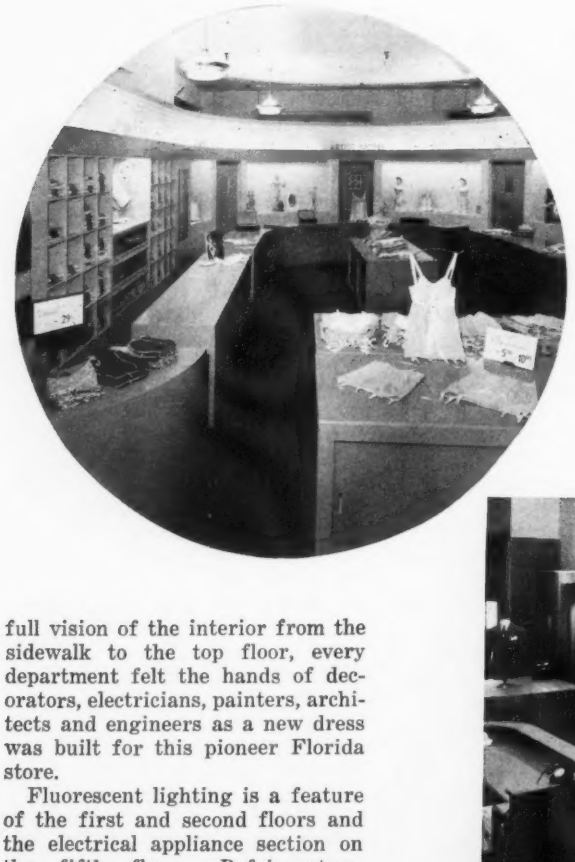
Nearly all the fluorescent tube auxiliaries for the first and second floors were installed in boxes located behind wall panels, so as to be accessible for replacement without disturbing sales floor or customers. Another virtue of installing auxiliaries behind wall panels instead of with reflectors as is common practice, was to eliminate the chance of faulty auxiliaries dripping tar on fabrics or displays. This possibility is not as far fetched as it sounds because it has happened in early fluorescent installations.

The second floor installation was made with a transformer for each lamp or tube and it was found necessary to install a capacitor in the line for each five lamps to keep the power factor at a reasonable figure.

On the first floor, however, a different type of installation was made using one transformer for each two tubes, a type of auxiliary that maintains power factor at better than 90 per cent. This type of installation, according to Mr. Meeks, reduces the maintenance cost, gives better service, gives less stroboscopic effect or flicker, and costs slightly less to install.

The lighting fixtures were assembled in the Maas plant, under the direction of Mr. Meeks, using several of the many brands of strip and reflector now on the market.

First floor lighting of display cases called for a different technic



Advantageous use of fluorescent lighting was made by Maas Bros. department store of Tampa, Fla., when a general remodeling of the store was undertaken recently. The photos on this and the following page show various departments of the store. In practically all applications of these new light sources, fixtures were concealed.

Another major change in the modernization program was the changing of the Colonial tea room from gas and oil heating for cooking to electric. The Colonial tea room is one of the most popular eating places in Tampa and yearly serves the 1000 band members of the Gasparilla band at one time, a feat annually featured in Tampa newspapers.

Many factors entered into remodeling the Colonial tea room kitchen. Room was at a premium, and gas and oil heating equipment took up more space than electric.

The fluorescent lighting fixtures were assembled in the Maas store, several brands of strip and reflector being used for this purpose. The new "two - lamp" auxiliary, which maintain power factor above 90 per cent, were used in most instances. An innovation of the installation was the placing of all auxiliaries behind wall panels thus simplifying repair.

and nearly all display cases were fitted by Garden City Plating and Manufacturing Co., Chicago, makers of Garcy fluorescent hardware. The type installed was satin-finish, although this company manufactures its reflector strip in all colors. The shortest tubes available were used in the display cases for bends and turns and the Garcy hardware was fitted around inside with mitered and soldered joints which presented a finished and pleasing appearance from above.

Daylight tubes were used throughout with the exception of several ladies dressing tables in the millinery department on the second floor. The blue cast on the face from daylight tubes although faint, was considered objectionable, so these tables were equipped with concealed tubes giving out a white light, similar to ordinary Mazda incandescent light. On either side of these dressing tables, displays were lighted with the regular daylight tubes.

Two lighting fixtures designed for matching fabrics were installed in the yard goods department, replacing other types of lighting used for the same purpose. It took 500 watts filtered through blue glass to give 25 foot candles on the counter with the old lights, which was never completely satisfactory.

Two complete units, each containing one 48-inch, 40-watt tube enclosed in an individual reflector, are suspended from the high ceiling by two satin-finished small size rods to provide for the new matching lights. These new lights provide 100 foot candles on the dark colored counter top and nearly 150 foot candles on bolts of white fabric and have proven valuable features of the yard goods department. As is commonly known, under this light, colors of fabrics remain the same as when viewed in daylight.

Some small idea of the size of the entire fluorescent installation may be gained from the fact that it was necessary to install 96 floor outlets on the first floor just to provide taps for display case lighting. More than 160 large size tubes, 48-inch, were installed and many more of various smaller sizes. Where long runs were made down long walls, largest size tube was used.

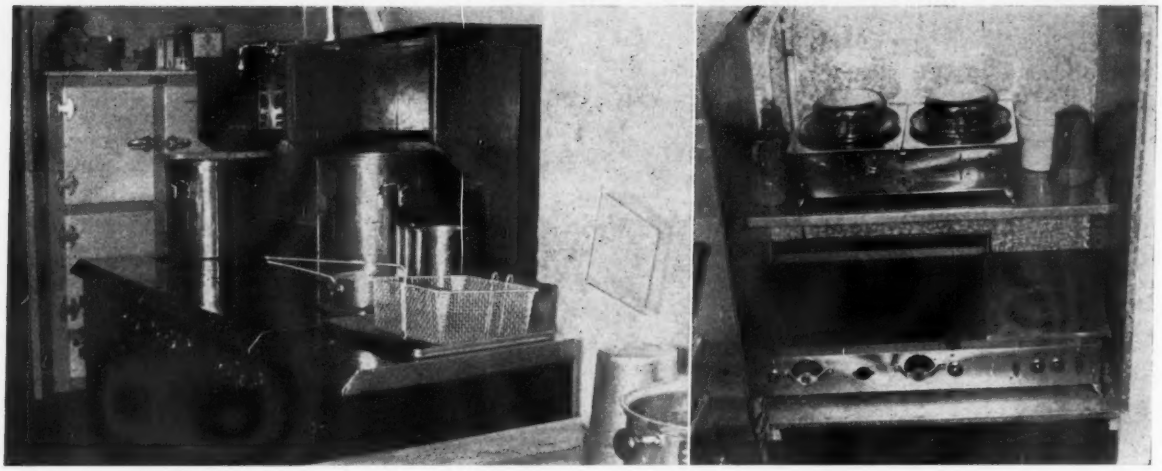
All fluorescent lighting is operated from 120 volt circuits. Main power lines come into the Maas Bros. basement at 2300 volts. The secondaries of the transformers are connected for service at 120 and 208 volts. Due to the method of installation and constant voltage maintained, there has been no detectable flicker in the lighting.

The kitchen was equipped with a 23-kw range, electric steam tables, waffle irons, toasters, a glass and dish washer. The steam table was equipped with heating units rated at 4,000 watts. A fry kettle with a 7,000-watt element was installed. The total load in the kitchen is estimated at 109 kilowatts.

The net result was a cooler kitchen, more space, and the asset and advantage of all electric cooking with its associated ease of accurate control of temperatures.

Maas Bros. is now entirely air conditioned from the basement to the roof. The work had to be done during business hours and was finished along with the complete remodeling program.

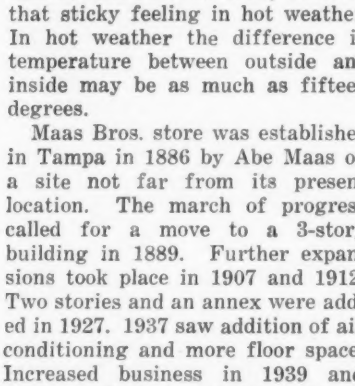
The refrigeration plant for this cooling is rated at 300 tons. Temperature is maintained at a pleasing ratio with the outside temperature, so as not to give customers too much of a freezing effect and yet be effectively cool.



An important item in Maas Bros. department store remodeling plan was the modernization of kitchen equipment for the store's fountain and tea room. Electric ranges and other appliances replaced oil and gas heated equipment. Total kitchen equipment load is estimated at 109 kilowatts and includes fry kettles, steam tables, grills, etc.

The inside temperature is raised one degree for each two degrees rise on the outside starting at 75 degrees and the humidity is kept at 50 per cent. This has been found to be most satisfactory with customers because it instantly removes that sticky feeling in hot weather. In hot weather the difference in temperature between outside and inside may be as much as fifteen degrees.

Maas Bros. store was established in Tampa in 1886 by Abe Maas on a site not far from its present location. The march of progress called for a move to a 3-story building in 1889. Further expansions took place in 1907 and 1912. Two stories and an annex were added in 1927. 1937 saw addition of air conditioning and more floor space. Increased business in 1939 and 1940 required the addition of two new floors. This recent expansion included complete redecorating and relighting.



R. L. Meeks, chief engineer, for Maas Bros. store, supervised all electrical and mechanical installation during the extensive remodeling operations undertaken recently.

Tables "A" and "B"

(See next page)

ALLOWABLE CURRENT-CARRYING CAPACITIES OF CONDUCTORS IN AMPERES

Based On Number of Conductors in Raceway or Cable

AWG or MCM	Types R and RW			Types RP, RPT, RU, SN			Types RH and RHT		
	No. Conds. in Raceway			No. Conds. in Raceway			No. Conds. in Raceway		
	1 to 3 100%	4 to 6 80%	7 to 9 70%	1 to 3 100%	4 to 6 80%	7 to 9 70%	1 to 3 100%	4 to 6 80%	7 to 9 70%
14	15	12	11	18	14	13	22	18	15
12	20	16	14	23	18	16	27	22	19
10	25	20	18	31	25	22	37	30	26
8	35	28	25	41	33	29	49	39	34
6	45	36	32	54	43	38	65	52	46
4	60	48	42	72	58	50	86	69	60
2	80	64	56	96	77	67	115	92	81
1	91	73	64	110	88	77	131	105	92
0	105	84	74	127	102	89	151	121	106
00	120	96	84	145	116	102	173	138	121
000	138	110	97	166	133	116	199	159	139
0000	160	128	112	193	154	135	230	184	161
250	177	142	124	213	170	149	255	204	179
300	198	158	139	238	190	167	285	228	200
350	216	173	151	260	208	182	311	249	218
400	233	186	163	281	225	197	336	269	235
500	265	212	186	319	255	223	382	306	267
600	293	234	205	353	282	247	422	338	295
700	320	256	224	385	308	270	461	369	323
750	330	264	231	398	318	279	475	380	333
800	340	272	238	410	328	287	490	392	343
900	360	288	252	434	347	304	519	415	363
1,000	377	302	264	455	364	319	543	434	380
1,250	409	327	286	493	394	345	589	471	412
1,500	434	347	304	522	418	365	625	500	438
1,750	451	361	316	544	435	381	650	520	455
2,000	463	370	324	558	446	392	666	533	466

DIRECT-CURRENT OR SINGLE PHASE SYSTEMS

No. Circuits in Raceway	Total Number Wires	Number Current-Carrying Wires	Equiv. 2-Wire Circuits	Allowable Current-Carrying Capacity No. 14 Conductor		
				Types R, RW	Types RP, RPT, RU, SN	Types RH, RHT
One 2-wire	2	2	1	15	18	22
Two 2-wire	4	4	2	12	14	18
Three 2-wire	6	6	3	12	14	18
Four 2-wire	8	8	4	11	13	15
One 3-wire	3	2	2	15	18	22
Two 3-wire	6	4	4	12	14	18
Three 3-wire	9	6	6	12	14	18

Conductor Capacity Will Vary With Raceway Occupancy

By Victor H. Tousley

Secretary-Treasurer, International Association of Electrical Inspectors
Chicago, Illinois

IF A NUMBER of conductors are installed in the same raceway, the heat generated in one conductor radiates and tends to raise the temperature of the conductors surrounding it and to cut down their allowable current-carrying capacity. The more conductors in a raceway, the greater this radiated heat and the lower the permissible current-carrying capacity.

Heretofore the code has made no distinction in the allowable current carrying capacity of conductors based on the total number of conductors contained in a raceway or cable. The 1940 code will make such a distinction. The allowable current carrying capacities of Table 1 of the code are based on from one to three conductors in a raceway or cable. (See July 1940 issue, page 10). Where the number of conductors in a raceway or cable is from four to six, each conductor will have an allowable current-carrying capacity of 80 per cent of the ampere ratings of Table 1; and from seven to nine conductors in a raceway or cable conductor will have an allowable current-carrying capacity of 70 per cent of the ampere ratings of Table 1.

The ampere ratings on the basis of these code provisions are shown in Table A.

In applying this table only conductors which carry full-load currents are to be considered. A neutral conductor which carries only the unbalanced current from other conductors, as in the case of normally balanced circuits of three or more conductors, shall not be counted in determining the carrying capacities.

There are two general types of circuits which will be involved in the application of this rule: the 3-wire circuit on direct-current or single-phase systems, and 3-wire or 4-wire circuits on 3-phase, 4-wire systems.

In the case of 3-wire circuits on direct-current or single-phase systems, one 3-wire branch circuit will be considered as having two conductors carrying current and the values of Table 1 can be used. If in place of a 3-wire circuit, two 2-wire circuits are used, there will be four conductors carrying full-load current and each conductor will have an allowable current-carrying capacity of only 80 per cent of the values shown in Table 1.

As the number of circuits in a single raceway is increased, this same principle applies, as is shown in Table B.

It will be noted that although No. 14 Type R conductor can be used for a 2-wire, 15-ampere branch circuit and for one 3-wire, 15-ampere branch circuit, a No. 14 Type R wire is not suitable if two 2-wire, 15-ampere branch circuits are installed in one raceway. Either a

(*Continued on page 45*)

Table "C"

THREE-PHASE, 4-WIRE SYSTEMS
15-AMPERE BRANCH CIRCUIT

No. Circuits in Raceway	Types R, RW	Types RP, RPT, RU, SN	Types RH, RHT
One 2-wire	No. 14	No. 14	No. 14
Two 2-wire	No. 12	No. 12	No. 14
Three 2-wire	No. 12	No. 12	No. 14
Four 2-wire	No. 10	No. 12	No. 14
One 3-wire	No. 14	No. 14	No. 14
Two 3-wire	No. 12	No. 12	No. 14
Three 3-wire	No. 10	No. 12	No. 14
One 4-wire	No. 14	No. 14	No. 14
Two 4-wire	No. 12	No. 12	No. 14

Table "D"

DIRECT-CURRENT AND SINGLE-PHASE SYSTEMS
15-AMPERE BRANCH CIRCUIT

No. Circuits in Raceway	Types R, RW	Types RP, RPT, RU, SN	Types RH, RHT
One 2-wire	No. 14	No. 14	No. 14
Two 2-wire	No. 12	No. 12	No. 14
Three 2-wire	No. 12	No. 12	No. 14
Four 2-wire	No. 10	No. 12	No. 14
One 3-wire	No. 14	No. 14	No. 14
Two 3-wire	No. 12	No. 12	No. 14
Three 3-wire	No. 12	No. 12	No. 14

Table "E"

THREE-PHASE, 4-WIRE SYSTEMS

No. Circuits in Raceway	Total Number Wires	Number Current Carrying Wires	Equiv. 2-Wire Circuits	Allowable Current-Carrying Capacity No. 14 Conductor		
				Types R, RW	Types RP, RPT, RU, SN	Types RH, RHT
One 2-wire	2	2	1	15	18	22
Two 2-wire	4	4	2	12	14	18
Three 2-wire	6	6	3	12	14	18
Four 2-wire	8	8	4	11	13	15
One 3-wire	3	3	2	15	18	22
Two 3-wire	6	6	4	12	14	18
Three 3-wire	9	9	6	11	13	15
One 4-wire	4	3	3	15	18	22
Two 4-wire	8	6	6	12	13	18

Colorful evidence of antiquity is to be found in historic old St. Augustine, founded in 1565. Through the Spanish Bayonets, one sees the towers of the ancient catholic church and the modern Hotel Ponce de Leon. At right is the Bridge of Lions which spans Matanzas Bay.

Florida Beckons !

Jacksonville contractors will be hosts to 38th annual convention of National Electrical Contractors' Association.

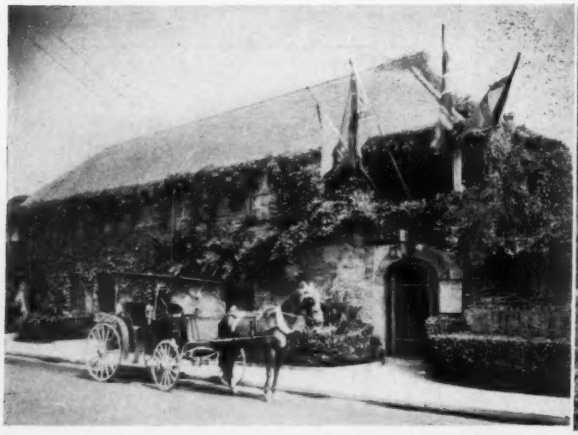
ONCE again the attention of the electrical industry will be directed toward the South as the National Electrical Contractors' Association holds its 38th annual convention in Jacksonville, Florida, October 21 to 23, 1940.

Details of the three-day business program are to be announced later but it is anticipated that the subjects to be discussed will be of such a general and practical character that attendane will be more than justified for non-member electrical contractors as well as members. Substantial progress has been made by the Association on its program for 1940 which was designed to furnish each member those services and information which are essential to the successful conduct of an electrical contracting business.

The objectives of this program, which are being achieved through well-organized committees, are to develop new markets and to assist the member in educating his organization to "sell" his services; to establish statistics upon which the industry can chart its course for the future; to create standards for the economic design of electrical installations; and to encourage lawful cooperation among the membership while presenting a united front against discriminatory legislation and energetic support of legislation beneficial to the contractor.

Aside from the value of its business sessions, NECA's Jacksonville convention promises every delegate a memorable entertainment program. Delegates and their ladies will receive an official welcome at a buffet supper and reception to be held in the ballroom of Hotel George Washington, convention headquarters, on Sunday evening, October 20.

Of the three days of entertainment planned for the convention, the Tuesday afternoon and evening program at Ponte Vedra Beach will be one of the most delightful. Immediately upon the close of the morning business session the delegates will be driven by buses to the



The scenic beauty and tropical splendor of Florida will make the Jacksonville NECA convention a memorable four days. At left above is one of the historic points of nearby St. Augustine—the oldest house, said to have been built before 1599. At right is a typical view in the tropical Oriental Gardens, in Jacksonville.

Ponte Vedra Club, where they will be joined later in the afternoon by the ladies of the convention following their entertainment at luncheon at the beautiful Yacht Club of Jacksonville after a morning of sightseeing.

The golfers will play the Ponte Vedra course, which is known as one of the six best courses in the United States. In one of the accompanying photos is shown the island 9th green of the Ponte Vedra Links, famous as one of the trickiest holes to be found anywhere.

The Ponte Vedra course tests the skill of low-handicap golfers to the utmost, yet is equally interesting to the golfer who hovers around the century mark. Lagoons border its velvet fairways and silken greens, and the highest tees overlook the Atlantic Ocean and a magnificent vista of gray-green tropical jungle.

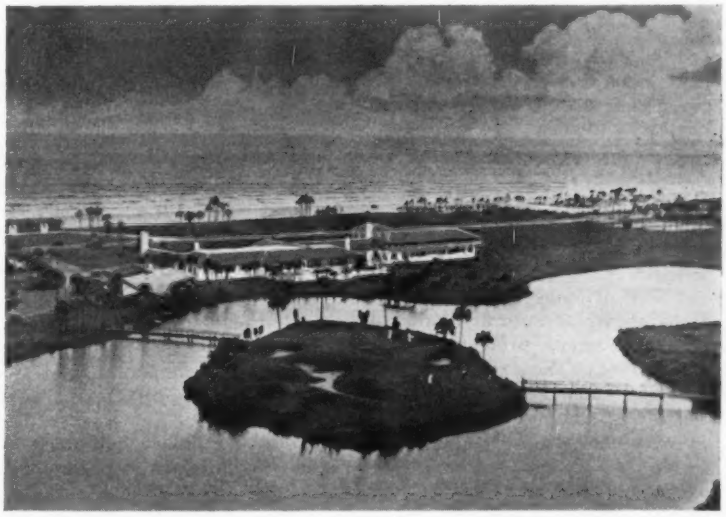
For those who do not play golf and for the ladies, the ocean-front Bath Club will be the headquarters, where lockers will be available for those who wish to swim in the ocean or the fresh water pool. Everyone should bring their bathing suits, either for a swim in the surf or for sunbathing on the sands of the gorgeous beach.

Members of the Jacksonville Chapter plan to have their cars at Ponte Vedra so that those of the party who wish to ride on this 600 foot-wide hard packed highway may enjoy the thrill of driving by the ocean's edge for a distance of 15 miles from Ponte Vedra to the jetties which protect the mouth of the St. Johns River.

Bridge tables will be arranged for the bridge enthusiasts in the "breezeway," which is a glass enclosed structure at the edge of the sand. Tennis and other sports will be available for those who desire them.

At the close of the day a buffet supper will be served, such as has brought local and national fame to the Bath Club. Seafoods for which the Inn is famous will await the party, who should all have developed good appetites through their afternoon of sports. The excellence of the Ponte Vedra cuisine is well known, so this supper is an event to be looked forward to.

A most unusual program of entertainment has been planned for the ladies. On Monday morning the ladies of the convention will leave by buses for Marineland, fifty miles south of Jacksonville on the Atlantic Ocean, arriving in time to see the feeding of the fish in the giant tanks, watching through clear glass windows as though the spectators were peering through the glass of a diving bell at the bottom of the ocean. Leaving Marineland they will return to St. Augustine for luncheon at the Munson Hotel, and the afternoon will be spent in an inspection of America's oldest city with its many historic points of interest.



An air view of Marineland showing the marine studios appears at left. This is the world's only oceanarium and the only especially designed under water motion picture studio. In the foreground can be seen a part of the Marineland fishing fleet. Tuesday afternoon and evening is to be spent at Ponte Vedra Beach which offers many attractions. Here one may enjoy surf bathing or a fresh water pool; dancing in the club patio; or golf on the Ponte Vedra links considered one of the six best courses in the country. Shown above is the tricky 9th hole.

On Tuesday morning the ladies will leave by buses for the Florida Yacht Club, where they will be entertained at luncheon and then taken from there to Ponte Vedra Beach Club.

On Wednesday the ladies will go on a sightseeing tour of Jacksonville covering the residential and historical homes, and the lovely gardens near the city.

Understanding and Using the National Electrical Code

By B. Z. Segall

New Orleans Public Service, Inc.
New Orleans, Louisiana

OVERCURRENT protection, in general, must insure safety for the wiring and equipment of electrical circuits. It is provided for the purpose of opening these circuits if the current flowing in them will develop a temperature in the conductors, detrimental to the physical characteristics of the insulation on the conductors.

With respect to the grounded conductor, the general principle is established that this grounded conductor is considered to have proper overcurrent protection if adequate protective devices are provided in *each* ungrounded conductor of this circuit. It should be noted that such protection must be in each ungrounded conductor of the circuit included with this grounded wire.

These primary requisites as set forth above, therefore, would limit the overcurrent protection to the safe current values as shown by the carrying capacity of conductors in Table 1 of Chapter 9. Thus, a No. 14 wire should at all times be protected by a 15 ampere fuse or smaller; a 4/0 wire, by a 225 ampere circuit breaker; and so on; for each of the various wire sizes. However, as a matter of practical application, this rule cannot be adhered to under all conditions. Five general exceptions have been recognized and these ofttimes have given rise to considerable misunderstanding and misapplication for specific installations.

The first exception provides for the omission of individual fusing of fixture wires and cords. This exception actually fixes two distinct limits for its application. First, a 15 ampere fuse, or circuit breaker is considered as ample protection for three types of wiring,

(a) Fixture wire
(b) Flexible cord
(c) Tinsel cord

provided, however, only sizes No. 16 or No. 18 are used. Many tests have generally proven that under the most adverse circuit conditions, there will be sufficient short circuit curent to blow the 15 ampere fuse. Tests have definitely shown that such protection is not offered by a larger fuse except for flexible cords as discussed in the following paragraph. It is for this reason that branch circuits feeding the standard type of fixtures using this small size fixture wiring, should never be overfused. The rules on branch circuit wiring, it will be remembered, required No. 14 and No. 12 wire for the taps to individual lamp holders and fixtures connected to the 20, 25, 35, and 50 ampere branch circuits.

The second limitation provides for the use of a flexible cord which is supplied and approved for installation with a specific appliance. Such cords may be connected to a 15, 20 or 25 ampere circuit and the overcurrent protection of these branch circuits will serve as the protection device for these cords. This applies to any flexible cord size No. 18 or larger.

The second exception permits overfusing of circuits feeding motor loads. In general, motors draw from three to ten times their rated full load current at starting. If the overcurrent protective device had to conform to the general rule, then in the case of motor circuits, the device would operate for almost every starting of the motor and would not permit the motor to come up to speed. Therefore, the code permits the overcurrent device for motor starters and controllers to have a rating in excess of the allowable current carrying capacity of the feeders serving the motor. The amount of overload varies with the type of motor and its operating conditions and will be fully discussed in a subsequent article.

The third exception is a correlating rule to provide for the tapping of smaller conductors to the larger main lines of a branch circuit without inserting overcurrent protection at the point of tap off. This was discussed to some extent in the analysis of the first exception above.

The fourth exception establishes the general rule for the omission of fuses or circuit breakers, under certain conditions, in the remote control wiring of switches. The rating of the overcurrent device must not exceed the current rating of the remote control wiring by 500%. Thus a 225 ampere breaker will not require fusing of the remote control conductors if they are large enough to carry one fifth of 225 amperes or 45 amperes. Thus, a No. 6 wire or larger must be used to take advantage of this rule.

It should be kept in mind, that in a case where a fuse is being used in the main line, the size of the remote control conductors should not be governed by this fuse size, but rather by the maximum size of the fuse which could be used in the particular fuse holder. Thus, a 70 ampere fuse would require a wire for the remote control circuit capable of carrying 70/5 or 14 amperes. A No. 14 wire, of course, would be ample. However, this same switch is capable of holding up to a 100 ampere fuse, so that the remote control wiring in many cases may have to be increased in size so as to carry 100/5 or 20 amperes. This would require a No. 12 wire.

In most cases these remote control circuits feed a coil or magnet

●

IN this fourteenth article of his series on the Code, Mr. Segall discusses the requirements relating to overcurrent protection, as covered in Article 240.

It is to be noted that since the 1937 Code is still in effect, Mr. Segall's discussion is based on the requirements of that edition. However, it has been his policy to point out any important changes that have been recommended for the 1940 edition.

winding having a definite impedance, therefore imposing a more or less constant and unvarying load on the control wiring. Generally, the impedance is high enough to limit the current to less than 15 amperes.

The fifth and final exception is but a cross indexing reference to certain exceptions allowed for taps taken from larger feeders but limited either in size, or length, or both. These are stated more explicitly in later rules for overcurrent protection (section 2434) and for motors (section 4349).

The overcurrent protection devices of conductors must under all conditions open the circuit under short circuit conditions. Many thermal devices such as cutouts and starters are designed to protect small motors from overloads, but cannot clear a circuit if a short circuit develops. These devices cannot be used as overcurrent protective devices and if used must be connected in series with suitable overcurrent protective devices.

The number of overcurrent devices required depends upon the particular circuit application. There are three conditions which require different treatment as far as the application of overcurrent protection to the circuits is concerned.

The primary rule states that an overcurrent device must be placed in each ungrounded conductor. The overcurrent device may be a fuse or a circuit breaker.

The first condition of application is for the protection of services. Here the primary rule must be strictly adhered to, i.e., one overcurrent device (fuse or circuit breaker) in each ungrounded conductor. Thus a four-wire, "wye" service having a grounded neutral must have three protective devices in the service feeders; a three wire, "delta" service, three devices, and so on for other systems.

Motor Circuit Applications

The second condition of application applies to the protection of motor circuit feeders. This will be discussed in detail in a later article. However, it may be stated briefly that if fuses are used as overcurrent protective devices for motor feeders, then each ungrounded conductor must have a fuse. The blowing of any one fuse in the circuit will safely disconnect the motor from the line. Thus a 110 volt service with grounded neutral feeding a single phase motor will have one fuse and when it blows, it definitely will cut off the service to the motor. In the case of a 220 volt, two wire ungrounded service feeding a 220 volt single phase motor it is quite possible for one fuse to blow and due to a defective motor feed back to a ground and allow the motor to run. However, if full load is applied to the motor, it will overload, due to low voltage conditions, and blow the second fuse, thus offering full protection to the motor circuit.

In the case of a three phase motor, one fuse blowing will allow the motor to run single phase. But the motor will overload very quickly under normal full loading conditions and blow one of the two remaining fuses to disconnect the motor.

If circuit breakers are used for motor circuits, then one or more overcurrent devices may be omitted. In this case the trouble in any one line of a single phase motor reflects in equal value in both lines and will, therefore, operate one overcurrent device to completely disconnect the motor. For a three phase motor only two devices are in general required since trouble on any one phase, actually affects two phases, at least, of the supply system so that at least one overcurrent device will operate under all motor circuit fault conditions to completely disconnect the motor from the line.

The third condition is a slight modification of the motor requirements. Actually, it is the basic rule for the motor requirements as set up in the above discussion but is somewhat broader in its scope in that it includes various types of branch circuits which may be taken off of a supply system. The rule again applies only to circuits having circuit breakers for protection. The various conditions are shown by the diagrams in Table 16. It is important to keep in mind that the trip coil or relays shall operate the circuit breaker in such a manner as to open all ungrounded conductors. This is especially important in the case of three phase motors to eliminate the possibility of the motor "single phasing" as outlined in the above discussion.

The rule does not apply to circuit breakers feeding only lighting or appliance branch circuits if these circuits include a grounded conductor. For such cases, single pole breakers may be used and all poles do not have to open simultaneously. This, of course, would apply to only 4-wire, three phase systems.

In the case of ungrounded 2-wire circuits or for the ungrounded lines of a 3-wire circuit, single pole circuit breakers may also be used. As was pointed out in the discussion of the motor circuits, any one pole will tend to stop a motor on single phase circuits, so that, under ordinary conditions, it is not necessary to open both lines of the feeder.

In general no overcurent device can be placed in a permanently grounded conductor. However, exceptions are allowed to this general rule:

> **First, the grounded conductor device must open, simultaneously, all conductors of the circuit.**
>
> **Second, certain localities will require a neutral device due to poor grounding facilities, or it is possible that connections to a circuit may be easily reversed. Then under these conditions the local enforcing authority may allow the neutral fuse or circuit breaker only if (a) the system has a ground neutral or one side grounded, and (b) only 2-wire branch circuits are used.**

It is necessary to limit such use to 2-wire branches. If a fuse were installed in a 3-wire branch, it is quite possible for conditions to develop where only the neutral fuse blows. This, then, allows the voltage on each side of the three wire circuit to be in proportion to the load on each side of the circuit. Thus, if four 100-watt, 100-volt lamps are on one side of the circuit and two lamps of the same rating on the other side, the total resistance of the four lamps would be 25 ohms and for the two lamps 50 ohms. The voltage drop across the four lamps would therefore be ⅓ of 200 volts or 66 volts and the other two lamps would have 200-66 or 134 volts impressed on them. This condition, of course, can become quite serious, depending on the amount of unbalance in the circuit.

A question asked quite often is what must be done to the neutral conductor when the ungrounded conductors are changed in size. The code definitely states that the neutral conductor may be changed in size to conform to the change made in the ungrounded lines. The current in the neutral is limited by the current in the ungrounded lines and as these are fused to protect the reduction in size of the ungrounded conductors, the neutral is also protected.

Fuses may be used in multiple.

(Continued on page 45)

APPLIANCE Service

Short Cuts and Time Savers In Appliance Servicing

By H. J. Wilkinson

Cleaning Condensers

A good brush to clean condensers with may be found at the average ten cent store in what is knkown as a milk bottle brush. These are sometimes given away as "door-openers" by brush salesmen and are ideal to get between the motor fan blades and condenser as well as other close places.

Condensing Unit Mounting Springs

Where condensing unit mounting or support springs are lost in shipment or in moving, a good substitute may be found in a small sponge rubber ball that can be purchased locally.

Belt Alignment

In place of the usual motor and compressor pulley aligning tool, a good substitute can be made from a thin piece of cardboard about ½ inch wide by 2 inches long. Slip the cardboard between one side of the belt and belt groove in the compressor flywheel until the belt binds on the cardboard. Mark the flywheel at the cardboard edge and repeat this procedure between the other side of the belt and the belt groove and again mark the flywheel. If the motor and compressor pulleys are in line, the two marks on the inner and outer edge of the flywheel will be in line. A little practice on this will soon tell you about how much it will be necessary to move the motor pulley in or out in order to make the marks line up and the belt to run true.

Changing Cooling Units

It is possible and practical to replace the cooling unit on conventional units with high side float valves without by-passing and pumping the refrigerant out of the float valve chamber. This is assuming that the float valve is not leaking which can be determined by how well the compressor holds a vacuum on the low-side after the refrigerant has been pumped out of the cooling unit. The pumping down process can be hastened by filling the trays with hot water. Even a slightly leaking float valve is not objectionable if the work is done in the shop. The saving in time to connect up by-pass and pump down float valve chamber is considerable, especially where it is inconvenient o apply heat to the float valve chamber to help vaporize the refrigerant there in.

Noisy Motor Pulleys

Brazing or welding of loose sheaves or fan of pressed steel motor pulleys that work loose and rattle is very satisfactory and economical. Otherwise, replace with new type pulley being very careful to use the exact size and diameter as the old one removed so as to not overload the motor or change the refrigerating capacity of the unit.

Stalled Motor

Where motor has stalled and bearing stuck for lack of oiling, the motor can usually be freed by putting two or three squirts of kerosene through the oil holes and allowing to stand a few minutes. As soon as the motor can be turned by the fan blades fairly easy, turn the current on the motor and fill the bearing with good motor oil. This will usually save taking the motor off and to the shop unless the motor is further damaged from lack of overload protection. Before doing any of this, always take the belt off and determine whether the motor or compressor is binding.

Defrosting

A good answer to the question "How often should I defrost my refrigerator?" is "Once a week, whether it needs it or not." This will cause the owner to set aside a regular day each week for defrosting and is satisfactory and easier to remember than trying to see or wait until the frost gets a certain fraction of an inch thick as most instruction books try to answer this question.

Running Refrigerant Lines

The usual practice of taping the suction and liquid lines together with friction tape on commercial installations can be improved on by using aluminum ribbon instead. This not only improves the appearance of the job, but the efficiency as well by acting as a heat exchanger in transferring the heat of the hot liquid line to the cool suction line and preventing its sweating. The aluminum ribbon is very easy to apply and is inexpensive. It can usually be obtained from the local public utility as it is used extensively on rural and other power lines using aluminum conductors.

Public Relations

Refrigerator repairmen can gather lots of good will and future business by carrying a few nichrome sleeves for repairing electric range coils.

These sleeves are very inexpensive and simple to use. A casual inspection of the range surface units can usually be made while working on the refrigerator and where a coil is found burnt in two, an offer to repair it at "no charge" will be accepted and not forgotten. Simply insert the two ends of the coil where it is parted into the sleeve and crimp the sleeve with a pair of cutting pliers.

Doesn't Brown on the Bottom

On complaint of insufficient browning of cakes, biscuits, etc., on the bottom always examine the baking utensils before making any thermostat adjustments on a range. Apparently the time and temperature given in the usual cook book accompanying the range is based on the customer using glass (Pyrex) ovenware. If the customer uses any other, it is best to vary

the time and temperature given in the instruction book to suit the particular kind of ovenware used. This can best be described by a test made by the writer and a home economist recently.

An "old fashioned pound cake" was made in sufficient quantity for three identical sized and shaped pans. All three were put on the same shelf in the oven, the same distance from each other and the walls of the oven and baked at the same temperature and length of time as shown in the cookbook given with the range. The results obtained were astonishing. The cake in the glass pan was a beautiful brown; top, sides, and bottom. The cake in the bright metal pan, while satisfactorily brown on top, had not even started to brown on the sides or bottom. The cake in the black metal pan was very brown on top and sides and almost burned on the bottom.

Safety Instructions

Home economists and others should be continually cautioned to impress on the person doing the cooking the importance of not letting the handle or corner of a pan touch the open coil on the top oven unit while it is turned on. A burned out coil and a frightened cook is the result as well as the possibility of a slight shock if the pan is handled with a wet rag. Also spilled contents of pan which are usually hot. In the interest of safety, enclosed oven units are to be preferred and should be standard equipment. The service man is in a good position to recommend conversion to modern units.

Humming of Water Heaters

The unusual complaint of a water heater humming can be due to the end of the hair-pin element touching the tank on the inside. In order to get sufficient wattage in these units, they are sometimes so long that it is necessary to bend them inside of the tank at time of installation in the tank. Where the end is allowed to touch the side of tank, due to insufficient bending, sometimes the regular a-c 60 cycle hum will be heard when the heater is operating. One recent complaint of a water heater humming was baffling for a while. The "hum" was finally traced to the electric meter which was fastened to the outside of the kitchen wall in which the heater was located and sounded as though it were coming from the heater.

MOTOR Service

Connecting Diagrams for Lap Wound A-c Motors

Part 13

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

WITH this article, we present the eight-pole, two- and three-phase, dual-voltage diagrams arranged for eight and nine leads, with connections for either four or eight parallels.

The two-phase, four- and eight-parallel connection of Fig. 40 has groups 1-3-5-7 between the A_1 and L_5 leads. Likewise, groups 9-11-13-15 are between leads L_7 and A_2. Thus the four-parallel connections have some corrective effect. The same thing holds true for the three-phase, four- and eight-parallel star connection, Fig. 41, and the three-phase, four- and eight-parallel delta connection of Fig. 42.

There are about five different methods employed in large plants to fasten leads into good electrical and mechanical joints. These are: half-and-half solder, high-tin-content alloy solder, oxy-acetyline or presto-light torch flame fusion or brazing, electric arc brazing, etc.

When solder is used, such as half-and-half or high-tin alloy, the best practice is to use two small ladles to pour the molten solder over the joint. In all cases the wires to be joined should be clean and bright and, preferably, pre-tinned.

Where insulation is present, care should be taken not to use an acid flux or paste. The best flux for this work is an alcohol and rosin solution. This can be purchased ready mixed from the large electrical manufacturing companies.

The tin solder commonly used has approximately 97% tin and has a melting point of about 232 degrees Centigrade, whereas half-and-half solder has a melting range of 181 to 231 degrees. Tin solder has a more critical melting point, that is, it doesn't soften or melt gradually, but flows readily at the proper temperature.

For pot soldering, i.e., using molten solder and hand pouring ladles, the solder in the pot should be maintained at 410 to 480 degrees Centigrade.

Thus more care must be taken with pure tin solder to heat the joint by using larger ladles and longer pouring. Also the pure tin flows quite freely and stick or ribbon solder should be used to fill the joint as it cools.

Only the high-tin-content alloys should be used for Class B insulated windings.

A method used in production by

●

THIS is the fourteenth article in a series that will present 45 modern connecting diagrams for two- and three-phase lap wound induction motors for use on four-, six-, and eight-pole windings.

A master table of the 45 diagrams was presented in the July 1939 issue together with the first three diagrams of the series. Three additional diagrams have appeared in each succeeding issue.

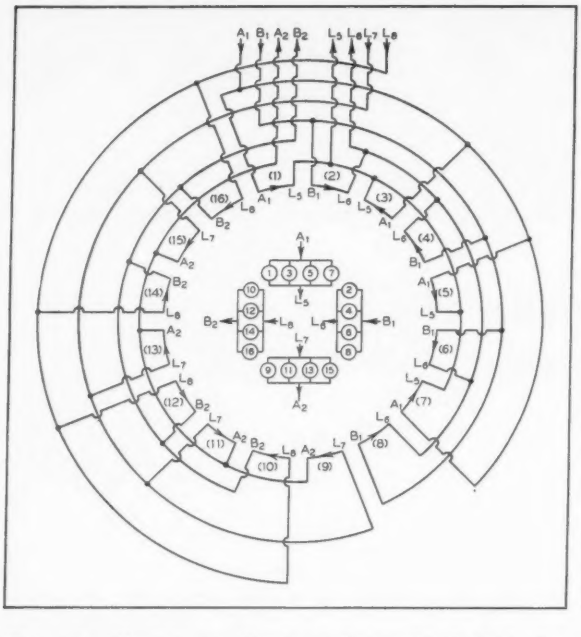


Fig. 40. Diagram for 8-pole, 2-phase with 8 leads for 4-parallel or 8-parallel connection. For 8 leads bring out A_1, A_2, L_5, and L_7 for A-phase; and B_1, B_2, L_6, and L_8 for B-phase. For 4-parallel connection, connect A_1 and A_2 to A-phase lines; connect B_1 and B_2 to B-phase lines; connect L_5 and L_7 together; and connect L_6 and L_8 together. For 8-parallel connection, connect A_1 and L_7 to A_1 line; connect A_2 and L_5 to A_2 line; connect B_1 and L_8 to B_1 line; and connect B_2 and L_6 to B_2 line.

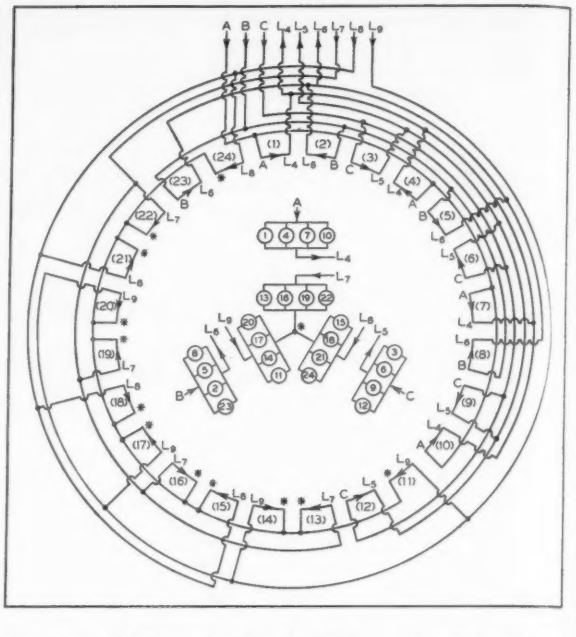


Fig. 41. Diagram for 8-pole, 3-phase with 9 leads for 4-parallel or 8-parallel star connection. Bring out 9 leads A, L_4, and L_7 for A-phase; B, L_6, and L_9 for B-phase; and C, L_5, and L_8 for C-phase. For 4-parallel star connection, connect A, B, and C to lines; connect L_4 to L_7; connect L_5 to L_8; and connect L_6 to L_9. For 8-parallel star connection, connect A and L_7 to A-Line; connect C and L_8 to C-line; connect B and L_9 to B-Line; and connect L_4, L_5, and L_6 together.

one large electrical manufacturer on the smaller partly closed slot windings, using mush coils gang mould, is to fuse the wires together with a gas flame. This is called the fusion method.

In this case the leads of the pole phase groups are twisted together without removing the insulation (that is for Class A insulated wires only), then any excess length is burnt off with the torch flame. The joint is then heated to the melting point before removing the flame. No flux is used. The same method is used to attach the flexible cable leads to the coil leads. Joints up to 5/16 inch in diameter can be made in this manner.

The advantage of the fusion method is the elimination of cutting or cleaning of the lead wires, when enamel, enamel and cotton, paper and enamel, or any Class A insulated wire is used, as the flame soon cleans the copper and the molten copper fuses together. However, when asbestos or glass insulated wire is used in the coils, the lead wires should be cleaned with revolving wire brushes or scrapers.

Another method commonly used with large conductors as employed with open slot coil windings is brazing with phosphor copper. This type of joint is best made with electrically heated carbon blocks. With phosphor copper brazing the joint wires should be clean, as no flux is applied. A piece of phosphor copper a little larger than the joint area is inserted. Then pressure and heat are applied with the electrically heated carbons until the phosphor copper flows. Pressure should be maintained until phosphor copper cools. The melting point of the

(Continued on page 45)

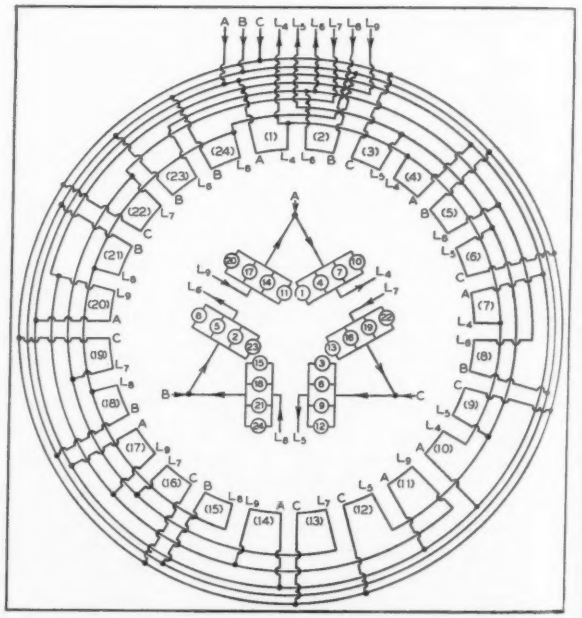


Fig. 42. Diagram for 8-pole, 3-phase with 9 leads for 4-parallel or 8-parallel delta connection. Bring out 9 leads: A, L_4, and L_7 for A-phase; C, L_5, and L_8 for C-phase; and B, L_6, and L_9 for B-phase. For 4-parallel delta connection, connect A, B, and C to lines; connect L_4 and L_7 together; connect L_5 and L_8 together; and connect L_6 and L_9 together. For 8-parallel delta connection, connect A, L_6, and L_7 to A-line; connect C, L_4, and L_8 to C-line; and connect B, L_5, and L_9 to B-line.

ENGINEERING SECTION

Band Width a Measure of Regulator Effectiveness

By W. J. McLachlan

Engineering Division, Central Station Dept., General Electric Company, Schenectady, N. Y.

FIRST cost! Losses! Exciting current! Ease of adjustment! Expected life! Noise! Maintenance! Physical size! Insulation strength! These are the factors evaluated in the application of regulators.

A regulator is installed for one purpose—to regulate voltage. Yet, most peculiarly, the characteristic which seems to be least often evaluated is the effectiveness of the device as a voltage regulator; that is, the closeness with which it will hold voltage as measured by band width.

Band width is the most important single characteristic of a feeder regulator. By band width is meant not the setting of the voltage-regulating relay, but the voltage actually held on each phase by the regulator. That these are two quite different things will be evident.

Band Width Worth Money

But first, is band width of importance from an economic standpoint? That it is seems obvious when the voltage characteristics of the usual feeder serving distributed load are considered (see Fig. 1).

The feeder comprises an express portion, to which no load is connected, and a local, or load-area, portion which connects to the various distribution transformers.

The voltage drop within the load area of the feeder is of prime importance, since the voltage delivered to all consumers within the area must be within predetermined maximum and minimum limits. The load which many distribution feeders can carry is limited by this load-area drop, and hence any factor affecting this portion is of prime economic importance.

In the example illustrated, it has been assumed that the feeder regulator holds the voltage within a two-volt band on each of the three phases. At a time of full load on the feeder it is assumed that the first transformer is relatively lightly loaded so that its voltage drop is one volt, which, when taken with a service drop of one volt, will permit a primary voltage at the first transformer of 127 volts if 125 volts, maximum, is to be delivered to the first consumer. This will mean that the regulator must be so set as to hold the primary voltage at the first transformer between 125 and 127 volts at the full-load period.

The voltage at the last consumer is less than the primary voltage at the first transformer by the amount of (1) the voltage drop in the load-area portion of the primary, which is assumed to be three volts, (2) the drop in the last transformer, which is assumed to be three volts, (3) the drop in the secondary, which is also assumed to be three volts, and (4) the drop in the customer's service of one volt. Using these values it will be seen that the voltage at the last customer varies between 115 and 117 volts at times of full load on the feeder, depending on the point where the regulator is within its band width.

Money has been invested in this feeder in order to carry load, and the effectiveness of the investment is determined by the amount of load carried. Any factor which tends to increase the spread in voltage between the first and last customers will reduce the amount of load which can be carried by the feeder and, therefore, make less effective the investment in the feeder. Conversely, a decrease in the spread in voltages will permit more effective use of the investment.

Now let us assume that the regulator band width is three volts—not uncommonly considered very good performance. The voltage drop within the load-area portion of the circuit must be reduced by one volt if the same maximum and minimum voltage criterion is to be met.

Cost of One Volt Drop

This one-volt reduction costs real money. One volt drop can be taken out of the primary, but this will allow only two volts instead of three in that portion. This will require a corresponding reduction in the amount of load which can be served by the circuit, thus decreasing the entire investment effectiveness to a marked extent.

The one volt can be taken out of the transformer drop by underloading transformers. This might be very good business for the transformer manufacturers, but will be expensive for the utility.

The secondary drop may be reduced from three volts to two volts, but this also will be found to be very expensive. Economic studies indicate that this will increase the investment in transformers and secondary in the order of $3 to $4 per kva. Thus, such an expedient will cause an increase in investment in the usual distribution feeder in the order of $6000 to $8000—certainly an appreciable sum to take

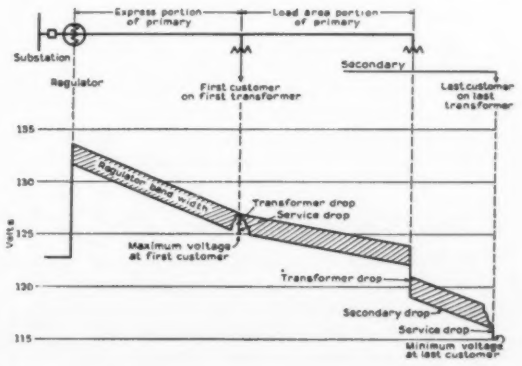


Fig. 1. Voltage characteristics of typical feeder

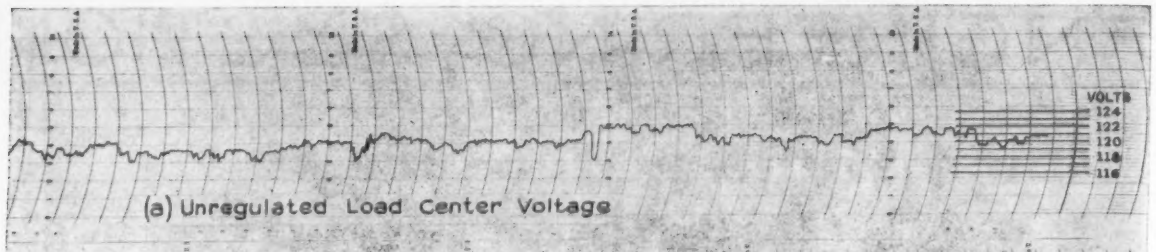


Fig. 2. Voltage charts showing improvement with induction voltage regulator.

into consideration when purchasing regulators.

Such considerations strikingly reveal the fact that differences in regulator band widths of as little as one volt, or a fraction thereof, assume real significance because of the marked effect on the load which can be carried by a given feeder.

Any difference in the band width of voltage held by the regulator will inversely affect the voltage drop which can be permitted in the load area of the feeder and thus *will definitely affect the amount of load which can be served by means of the investment which has been made in the feeder.*

Factors Affecting Band Width

If band width is of such economic importance, it is essential that all the factors which affect the relative band width should receive complete consideration when applying feeder regulators. What, then, are these factors? Chiefly, other than any inherent limitations in the setting of the voltage-regulating relay, they are:

1. Bus regulation vs. individual feeder regulation.
2. Single- vs. three-phase regulators.
3. The ability of the regulator to withstand frequent operation.
4. The size of step in step-voltage regulators.
5. Frequency, temperature, and other errors in the control.

Bus vs. Feeder Regulation

Bus regulation involves the controlling of the voltage of several feeders as a group and is the equivalent of individual feeder regulation *if, and only if, the voltage requirements of all feeders are identical.* This means that the feeders must be of exactly the same length and conductor size and arrangement. They must have the same load, and the load must occur at the same time. Familiarity with actual distribution circuits leads to the conclusion that it is virtually impossible to find even two distribution feeders that answer these requirements. The characteristics of the individual feeders differ; hence individual-feeder regulators will hold narrower band widths of voltage on each feeder than can be obtained with bus regulation.

When comparing bus regulation with individual-feeder regulation, it is necessary to consider the voltage drop, not only in the load-area portion of the feeders, but also in the express portions. Differences in the voltage drop in *all* portions of the various feeders will make it impossible to hold as close voltage when regulating the feeders as a group as when regulating them individually. The best that can be done is to regulate for the average. The difference between this value and the actual drop in an individual feeder will subtract directly from the drop which can be permitted in the load area of that feeder. As outlined above, such limitations cost real money to such an extent that even a difference of only a fraction of a volt in the regulation requirements of the various feeders may justify the higher cost of individual feeder regulation.

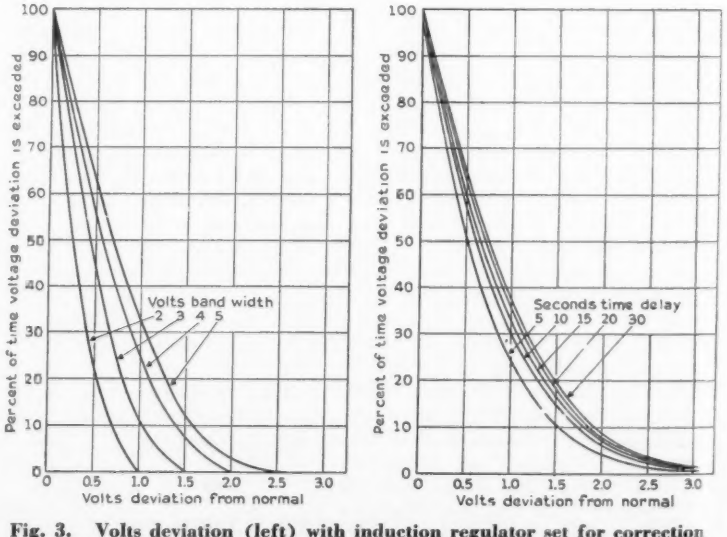


Fig. 3. Volts deviation (left) with induction regulator set for correction to middle of band, and (right) with step regulator set for 2-volt band with 5/8% steps.

Such considerations may lead to questions as to the increasing use of bus regulation in unit-substations. In this connection, two facts should be kept in mind.

1. Unit substations are usually of a size little, if any, larger than one conventional distribution feeder.

2. Unit substations are installed in the load area, at the load center. Hence, differences in the voltage drop of express portions of feeders from such substations, which would subtract from the drop allowable in the load-area portions, are either non-existent or at the minimum.

In cases where such conditions exist, the economic advantages of individual-feeder regulation decrease to such an extent as to be outweighed by the higher cost of such regulation.

Bus Versus Individual Feeder Regulation

In a manner similar to the comparison between bus and individual-feeder regulation, single-phase regulators usually have a distinct advantage over three-phase regulating devices inasmuch as the three-phase device can hold at best only an average voltage on the three phases, whereas single-phase regulators can hold voltage on each phase. Distribution-feeder loads consist largely of single-phase loads connected to each of the three phases, and some difference in connected phase loads is inevitable and variations in the time that load is in use on the various phases is unavoidable. Again, impedance to the individual-phase load centers may differ. Single-phase regulators therefore, are found to hold considerably better voltage than a three-phase regulator, and the difference permits a correspondingly greater voltage drop in the load area of each individual phase and thus permits carrying more load when single-phase regulators are used.

The use of two single-phase regulators in open delta usually has a distinct advantage over the three-phase regulator, although the advantage obviously is not as marked as with three single-phase regulators. The open-delta connected regulators will operate to meet the exact requirements of two of the three phases, whereas the best that can be done with the three-phase regulator is to meet the exact requirements of one phase, or a compromise value between two phases.

Distribution-feeder loads fluctuate; thus the requirements for voltage correction by a feeder regulator vary continually. The regulator which is capable of operating very frequently and of correcting the voltage immediately when it departs from a given band width will obviously hold the effective voltage within closer limits than one which cannot be arranged to make as many voltage corrections or to make them as quickly. A regulator which would hold the voltage to exactly 100 per cent with zero band width would be required to operate practically continuously. As the regulator operation departs from being continuous, the effective band width of voltage held must increase. *It is impossible to correct for voltage drops which are continually fluctuating with a device which must have its number of operations limited to a fraction of the total number of fluctuations.*

This leads directly to the comparison between induction and step-voltage regulators for distribution-feeder service. Induction regulators can operate with instantaneous response to follow immediately the fluctuations in voltage. Step-voltage regulators cannot withstand this number of operations; hence the inclusion of time-delay in the control.

In this connection, Fig. 2 and 3 will be of interest. Fig. 2 (a) shows a portion of a voltage chart taken with a photoelectric recorder having a chart speed of three inches per minute and a pen travel of approximately one-half inch for a three-volt change. With such an instrument we are able to see what voltage actually does, and thus are enabled to analyze accurately the performance of various types of regulating devices. The chart shown is one of unregulated voltage at the feeder-load center.

A regulator having a time delay of 25 seconds or more in its response will not operate during the period shown on this chart. An induction regulator with instantaneous response will correct this voltage to that shown in Fig. 2 (b).

Fig. 3 shows the results which obtain when regulators with different characteristics are used to correct voltage such as that of Fig. 2 (a). It will be noted that the induction regulator with instantaneous operation when set for a two-volt band width holds the voltage within plus or minus one volt practically 100 per cent of the time. The voltage is within plus or minus one-half volt 75 per cent of the time, and within plus or minus one-fourth volt 50 per cent of the time. With the step-voltage regulator having ⅝ per cent steps and a two-volt band setting, the inclusion of as little as 5 seconds time delay allows the voltage to deviate as much as plus or minus two volts 5 per cent of the time and holds the voltage within plus or minus one volt only 75 per cent of the time. The voltage falls within plus or minus half a volt only 50 per cent of the time. In this particular case the voltage held is approximately equivalent to that held with the induction regulator having instantaneous response when set for a four-volt instead of a two-volt band width.

The voltage on this circuit may fluctuate to a greater extent than that on the average distribution circuit. However, the effect of

(*Continued on page 44*)

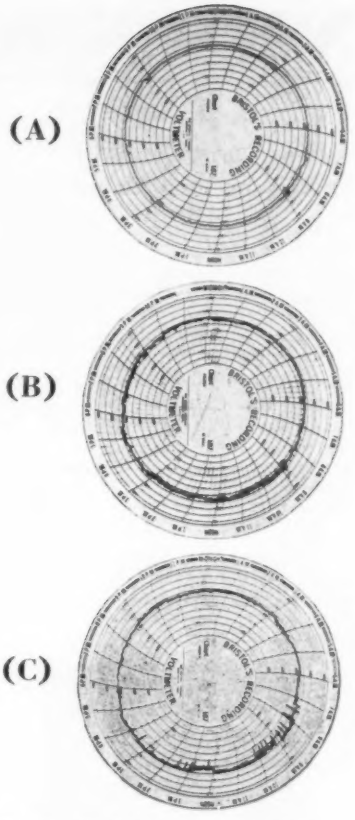


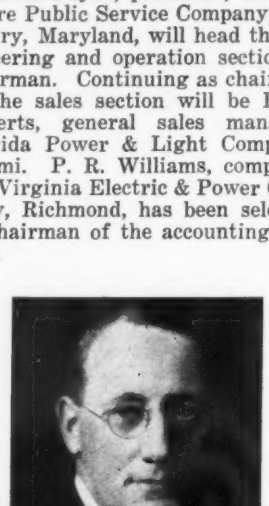
Fig. 4. Performance charts showing effectiveness of regulation. Chart A is typical of charts, obtained with single-phase induction regulators. Voltage throughout the 24-hour period is held within a two-volt band width. Charts B and C, obtained with three-phase, 5/8% step-type, regulators, show effective band widths of 3½ to 4 volts.

NEWS of the INDUSTRY

Section Organization Announced for Exchange

Section and committee organizations for the new administrative year of the Southeastern Electric Exchange were recently announced by President Albert W. Higgins, of St. Petersburg, Florida.

Lewis Payne, president, Eastern Shore Public Service Company, Salisbury, Maryland, will head the engineering and operation section as chairman. Continuing as chairman of the sales section will be R. B. Roberts, general sales manager, Florida Power & Light Company, Miami. P. R. Williams, comptroller, Virginia Electric & Power Company, Richmond, has been selected as chairman of the accounting section.



Lewis Payne

J. M. Stafford, Jr., assistant manager, advertising department, Georgia Power Company, Atlanta, will head the employees activities committee. E. K. IlgenFritz, treasurer of Florida Power Corp., will serve the Exchange as treasurer for the ensuing year. John W. Talley will continue as executive secretary of the Exchange with headquarters in Atlanta.

E. K. IlgenFritz

Only the sales section of the Exchange is subdivided into special committees. Chairmen of these committees for the new administrative year are as follows: merchandising committee, L. M. Taylor, sales promotion manager, Mississippi Power & Light, Jackson; lighting committee, W. B. Shenk, commercial engineer, Virginia Public Service Company, Charlottesville; industrial power committee, C. N. Rackliffe, manager power sales, Carolina Power & Light Company, Raleigh; sales promotion and advertising committee, E. N. Pope, director of sales promotion and advertising, Carolina Power & Light Company, Raleigh; and the rural electrification committee, L. W. Gray, rural sales manager, Georgia Power Company, Atlanta.

Wholesalers Semi-Annual Meeting Announced

The semi-annual convention of the National Electrical Wholesalers Association will be held at the Hotel William Penn, Pittsburgh, Pennsylvania, October 22-25, 1940.

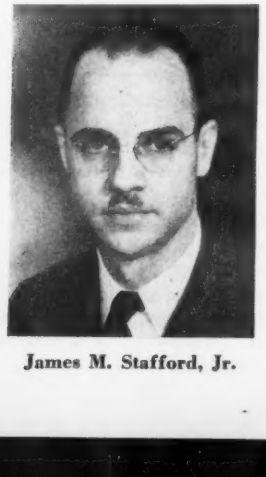
Plans Progress For Houston IAEI Meeting

Both business and entertainment programs for the annual meeting of the Southern Section, International Association of Electrical Inspectors, are nearing completion. The Southern Section will meet in the Rice Hotel, Houston, Texas, on September 16, 17 and 18.

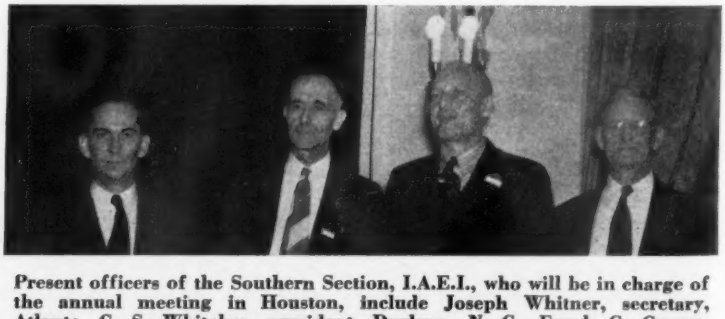
Principal feature of the meeting will be general discussions on the 1940 National Electrical Code with a view of helping inspectors and others in attendance gain familiarity with the new requirements. These discussions, however, will be conducted in a somewhat different manner than in the past, according to the chairman of the meetings and paper committee, A. J. Bommer, Dallas.

Instead of the usual section by section, and article by article, discussion of the Code, it is planned to hold symposiums on each section of the Code. These symposiums will be lead by at least five outstanding persons in that particular field. In general each discussion group will include representatives of the manufacturers, contractors, inspectors, utilities, and insurance organizations. The discussions will be open to the entire audience and it is hoped that this type of meeting will promote more activity from the floor than experienced in the past.

In addition to the general code discussions there will also be several featured talks. Among those who will address the group will be K. W. Adkins, International president, St. Louis, Mo.; C. S. Whitaker, president, Southern Section, Durham; Victor H. Tousley, general secretary, Chicago; J. Warner Pyles, R. E. A., Washington, D. C.; E. G. Romeiser, Electrical Porce-



James M. Stafford, Jr.



Present officers of the Southern Section, I.A.E.I., who will be in charge of the annual meeting in Houston, include Joseph Whitner, secretary, Atlanta, C. S. Whitaker, president, Durham, N. C., Frank G. Camus, first vice president, Shreveport, La., and W. A. Stall, second vice president, Jacksonville, Fla.

lain Manufacturers; Lawrence W. Davis, general manager, National Electrical Contractors Association, New York; G. E. Manning, Underwriters Laboratories, Chicago; George C. Hawley, Texas State Insurance Commission, and H. Oram Smith, manager Texas Inspection Bureau.

Entertainment program for the ladies will include luncheons, teas and style shows, and sight-seeing trip to San Jacinto Battle Grounds and other points of interest. For the men special noonday luncheon entertainment is being prepared for Monday and Tuesday. The annual dinner dance will climax the entertainment program on Wednesday evening.

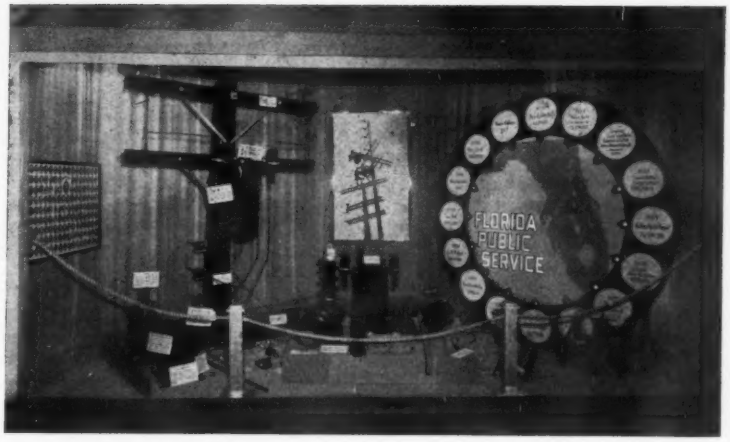
REA Plans Extensive Building Program

The Rural Electrification Administration is shaping plans for the early construction of $100,000,000 of new rural power lines to serve some 300,000 farm families and other rural users, Administrator Harry Slattery announced recently.

Preliminary and tentative schedules of allotments have already been prepared. Of the total of $100,000,000 to be expended, the preliminary allotments would give the southern states a total of $44,468,239. Largest allotments in the southern states group will go to Texas, $9,000,000; Tennessee, $6,000,000; and Georgia, $5,000,000. All of the sixteen southern states will participate in the loans to some extent.

In June, REA conducted a series of statewide meetings of leaders in the rural electrification movement to determine where applications for loans are under development and what progress has been made. Because many applications have been pending a long time and are urgent, REA will allot immediately a substantial part of the loan funds available for the entire year.

In connection with this construction program, Administrator Harry Slattery has invited all suppliers of poles, wire, transformers, and pole line hardware to confer with REA officials in Washington on rural construction requirements for the coming year. The funds available for the fiscal year will permit construction of 92,000 miles of rural distribution lines, in addition to necessary power plant construction and supplementary loans for wiring, plumbing, and additional service drops. Material required will include more than 200,000 miles of wire for conductors, 230,000 transformers, and nearly 1,850,000 poles.



This interesting exhibition of "Tools of Electric Service" received much favorable comment at a recent Florida fair. The display, exhibited by Florida Public Service Company, gave the public a close-up view of "what goes up on top of a pole." Featured also in the exhibit was a story about the operation of the company for the year 1939. This was displayed in graphic form in the ten-foot circle at the right. The fair drew over 100,000 people.

At the close of the last fiscal year, June 30, more than 200,000 miles of REA-finance power lines were in operation and about 550,000 consumers were already getting service. A hundred and twenty thousand of these consumers were added during the first six months of 1940.

Wiring Campaign Opens in New Orleans

A broad range adequate wiring campaign was launched by the Electrical Association of New Orleans at a meeting held July 1. This movement seeks to take advantage of the building revival and proposes many methods of bringing it about.

The campaign will continue until the end of 1940. It offered contractors accurate data on minimum electrical requirements, presented a plan for certified adequate wiring, outlined a contest for the contractor making the greatest number of certified wiring jobs, distributed lapel buttons to contractors for the campaign and made other suggestions to advance interest in adequate wiring.

The meeting was held at the auditorium of the New Orleans Public Service, Inc., with George Segel, secretary of the Electrical Association presenting the outline for the campaign. J. Otto Kaelin, chairman of the adequate wiring bureau, presided.

Talks were made by Paul Muller, city wiring inspector, and George Wellman, representative of the Louisiana Rating and Fire Prevention Bureau, stressing the value to the city and others arising from complete wiring of buildings, aside from the comfort, convenience and safety of the home owner.

Copies of "Residential Wiring Standards," showing outlets, circuits, wire sizes, terminals and other information needed by the contractor for installations to comply with minimum requirements and thus be eligible for an adequate wiring certificate, were distributed.

A second pamphlet outlined the contest for electrical contractors for the most certified adequate wiring jobs. This presented the talking points favoring adequate wiring in addition to details of the contest.

Ben Z. Segall of the New Orleans Public Service engineering department, presented a talk illustrated with slides on thin wall wiring.

Notes from the Field On Adequate Wiring

Two cities were added in July to the list of those now operating the National Adequate Wiring Bureau's certification plan. The Adequate Wiring Bureau of Roanoke has recently received a license to operate the certification plan in the city and county of Roanoke. W. W. Krebs, of the Appalachian Electric & Power Co., is chairman of the local A. W. Bureau, the thirty-ninth to undertake this phase of the adequate wiring activity.

The Jacksonville Adequate Wiring Committee was the fortieth group to receive a license from the National Bureau to operate the certification phase. This local plan will operate in the city of Jacksonville and in certain portions of Clay,

Duval, Nassau and St. John's counties, Florida. J. F. Ulrich is secretary of the Jacksonville Adequate Wiring Comittee.

* * *

Adequate wiring will be permanently featured and demonstrated in four operatively built homes through a comprehensive promotion for San Antonio announced by R. E. Sivley, manager of the commercial department, San Antonio Public Service Co. Each of four operative builders has agreed to equip one home with the following services—comfort cooling, light conditioning, properly planned kitchens and adequate wiring. Members of the utility's lighting advisory staff will be assigned to demonstration duties.

The tour method will be employed in conducting visitors through each home and all outlets will be clearly designated for the service which they provide, using the marker cards designed by the National Bureau. Edward A. Gauthier, of the utility's sales promotion division, advises that these homes will be extensively advertised. Each promotional home will be opened to the public at 30-day intervals.

New Home for Miami Graybar

Graybar Electric Company recently moved its Miami, Fla., branch into a brand new, especially constructed concrete and steel building in the heart of the city's wholesale builder's supply district. With a frontage of 75 ft. on N. W. First Ave. between 8th and 9th Sts., the structure has an area of 12,000 sq. ft.

The architectural plan makes possible a particularly efficient arrangement of display, service and office facilities. Vestibuled entrance in the building's front gives direct access through separate doors to the display room and to the office. The latter includes a glass-enclosed private office for the branch manager.

The proportions of the showroom offer excellent advantages for effective display. Its artificial lighting system combines necessary illumination with a cleverly arranged display of indirect, semi-indirect and fluorescent units in varied styles.

One of the most outstanding features of Graybar's new quarters from the standpoint of convenience is its "City Service Dept." Running parallel to the long dimension of the building and extending back 24 ft. from the rear of the office, this department can be reached from the latter or directly from the parking area through a side entrance. The City Service room has a depth of 15 ft. and is separated from the warehouse by a counter with a glass front for the display of small appliances.

More than 12,000 sq. ft. of space is provided in Graybar's new Miami branch building for display, office and service facilities. Present at the branch's official opening were, left to right, L. G. Fields, branch manager, Douglas Wallace, district manager, and C. A. Harris, district merchandise manager.

To celebrate its 15th Anniversary, as well as its removal to larger and better quarters, Graybar's Miami branch held a "house warming" recently. Among company officials present at the opening were Douglas Wallace, district manager, and C. A. Harris, district merchandise manager. The celebration was well-attended by South Florida electrical contractors, dealers, wholesalers and their representatives.

L. G. Fields is branch manager, having served in that capacity for the past 12 years. W. W. Castleberry is service supervisor.

"In the Bag" Contest Goes Well Over Quota

A 60-day "In the Bag" sales contest recently sponsored by the Electrical Appliance Dealers Association of Alabama resulted in the sale of 2,489 ranges and water heaters.

Approximately $1,000 worth of prize money, as contributed by 11 appliance distributors in the state, was the incentive for the campaign in addition to the usual commissions. All dealers and salesmen on the lines of the Alabama Power Company were eligible to compete and the winners of the prizes were pretty well distributed over the state. The state was divided into six sections for the campaign and all but two exceeded their quotas.

Distributors cooperating in the campaign were: Alabama Appliance Co., Watts-Newsome Co., Frigidaire Corporation, Graybar Electric Co., Matthews Electric

(*Continued on page* 44)

Southern Section's Honor Roll

No let-up is to be noticed in the campaign for new members that is being conducted by the Southern Section, International Association of Electrical Inspectors. Thirteen new members were enrolled during the month of July, according to Joseph Whitner, secretary of the Southern Section.

Members of the Southern Section who have obtained new members, and the number they have enrolled are as shown below:

Armtsrong, W. E.	1	New York, N. Y.	1
Benefield, F. H.	1	Atlanta, Ga.	1
Boker, C. S.	6	Charlotte, N. C.	6
Bommer, A. J.	9	Dallas, Texas	9
Bowry, T. W.	2	Richmond, Va.	2
Branch, T. P.	3	Atlanta, Ga.	3
Bulls, Claude V.	2	Norfolk, Va.	2
Camus, Frank G.	3	Shreveport, La.	3
Cannady, N. E.	2	Raleigh, N. C.	2
Dunn, W. Edward	1	Alexandria, Va.	1
Evans, Carl W.	3	Atlanta, Ga.	3
Gilliam, R. S.	1	Atlanta, Ga.	1
Goodson, Fred	7	Houston, Texas	7
Hancock, A. E.	4	Austin, Texas	4
Hendricks, R. B.	12	Llano, Texas	12
Jones, Cecil	1	Atlanta, Ga.	1
LaTour, John	3	Daytona, Fla.	3
Lee, J. Duval	1	Lynchburg, Va.	1
Littlefield, R. T.	2	Jesup, Ga.	2
Lowrey, R. H.	1	Lubbock, Texas	1
Johnson, Dewey	1	Atlanta, Ga.	1
Kenderdine, E. L.	2	Fort Worth, Texas	2
Knoderer, H. G.	1	Bridgeport, Conn.	1
Hinton, Thos. E.	1	Schulenburg, Tex.	1
Miller, G. M.	4	Richmond, Va.	4
Moody, G. W.	1	Summerville, S. C.	1
Muller, P. L.	1	New Orleans, La.	1
Muths, S. L.	1	Gulfport, Miss.	1
Pockrus, L. S.	2	Tyler, Texas	2
Pyles, J. Warner	2	Washington, D. C.	2
Ross, G. M.	1	Sheffield, Ala.	1
Russey, C. D.	1	Greenville, Tex.	1
Segall, B. Z.	2	New Orleans, La.	2
Sheffield, J. E.	1	Lovington, Va.	1
Sharborough, S.	2	Dallas, Texas	2
Sprouse, J. B.	2	Clarksdale, Miss.	2
Stewart W. B.	11	San Antonio, Tex.	11
Taylor, W. R., Jr.	1	Atlanta, Ga.	1
Wagner, C. M.	4	Hondo, Texas	4
Walthall, J. D.	1	Homer, La.	1
Wheeler, Chet	2	New Orleans, La.	2
Whisenant, H. A.	2	Bessemer, Ala.	2
Whitaker, C. S.	8	Durham, N. C.	8
Whiting, C. T.	1	Gainesville, Fla.	1
Whitner, Jos.	12	Atlanta, Ga.	12
Zimmer, Chas. S.	3	Houston, Texas	3
Miscellaneous	15	(not endorsed)	15
Total	150		

(1) Paper Insulated Cables: Complete specifications, catalog data, and much interesting general information relating to paper insulated power cables are included in a 40-page catalog issued recently. The booklet is profusely illustrated. **American Steel & Wire Co., Cleveland, Ohio.**

(2) Hand and Motor Winches: A new folder covering a complete line of hand and motor winches for lifting and pulling loads up to 3000 pounds. **Stephens--Adamson Mfg. Co., Aurora, Ill.**

(3) Hot Line Tools: A new catalog is now available containing complete listings of all Tips hot line maintenance equipment, grounding equipment, hot tap clamps, and fuse tappers. The book is loose leaf type, indexed for easy reference, and contains a section on methods of doing hot line work. **A. B. Chance Co., Centralia, Mo.**

(4) Pole Line Hardware: Catalog No. 10 has just been issued and copies are available to the trade. It contains a wide range of pole line hardware and electrical specialties. **Electrical Manufacturing Co., Battle Creek, Mich.**

(5) Research Explained: This most unusual 32-page booklet tells by means of many photographs and brief text how a new type of insulation for wires and cables is developed, put into production, and finally checked and tested in laboratory and proving ground. Almost as stimulating as a trip through the factory itself, users of insulated cable will get much pleasure from this well-prepared booklet. **The Okonite Company, Passaic, N. J.**

(6) Fluorescent Lighting Data: Benjamin's new Bulletin No. 40 is a real answer to an industry's need. In 46 pages of charts, diagrams, tables and photographs are the facts and data needed to determine how and where to use fluorescent lighting to best advantage in factory, office and store. One section contains informative data in question-and-answer form. Most of the book is devoted to complete descriptions, specifications, and listings of Benjamin fluorescent lighting equipment. Of particular interest are the many illustrations showing outstanding fluorescent lighting installations. **Benjamin Electric Mfg. Co., Des Plaines, Ill.**

(7) Hotpoint Hi-Speed Calrod: This is a new 16-page visualizer just issued by the Hotpoint Company for use by retail salesmen. The exclusive features and advantages of Calrod units are listed and the uses of the five "Measured Heats" are graphically described. **Edison General Electric Appliance Company, Chicago, Ill.**

(8) Synchronous Motor Control: A new publication on automatic control for synchronous motors containing eight pages describing polarized field frequency automatic control as well as the function and construction of the various control parts. Connections of a typical control are illustrated. **Electric Machinery Manufacturing Company, Minneapolis, Minn.**

(9) Pin-It-Up-Lamps: A new catalog in six colors which portrays the line of Pin-It-Up lamps and makes an excellent selling medium. In addition to an entirely new line of Pin-It-Up lamps the booklet describes Wallettes, light conditioning adaptors, and portable commercial equipment. **The Railley Corporation, Cleveland, Ohio.**

(10) Hazakrome Handbook: This 32-page booklet provides answers to the many questions that confront contractors, wholesalers and others in the application of Type SN small diameter building wire. The contents include engineering data and complete wiring tables, case histories of actual installations, and an analysis of the market and suggestions for developing it. **The Okonite Company, Hazard Insulated Wire Works, Wilkes-Barre, Pa.**

(11) Colt Electrical Products: A quick reference listing of all Colt electrical products is now included in "Catalog No. 3." This interesting catalog available upon request contains 84 pages of description, including safety switches, multi-breakers, service equipment, fuses and a complete listing of Sizes "0" and "1" in new motor control units. **Colt's Patent Fire Arms Manufacturing Company, Hartford, Conn.**

(12) Flamenol Wire and Cable: This publication, No. GEA-2733D, provides information on the many types of Flamenol wire now available as well as listing many of its various applications. **General Electric Company, Schenectady, N. Y.**

(13) Miller Fluorescent Troffers: This new catalog section describing Miller Fluorescent Troffers is really more than a catalog; it is a complete working manual that gives step-by-step data that will effect economies in planning and working out installations. These new Miller units may be recessed in the ceiling individually or in continuous row formation to provide lighting for general illumination of offices, factories, drafting rooms and similar locations. **The Miller Company, Meriden, Conn.**

(14) The Skeleton In The Walls: The tale of a haunted house, of a young wife who longs for the simple drudgery-producing devices of her grandmother's day, and of how a wily appliance salesman almost shattered the Higglespoons' bliss is all embodied in "The Poor Wife's Revenge," a picture book for grown-ups that has just been produced by the General Electric construction material division to promote the story of good home wiring. The book includes a handy check list of situations, stemming from inadequate wiring, that may be bothering the average individual. **General Electric Company, Bridgeport, Conn.**

(15) Samson Matched Appliances: A wide range of household appliances are described and illustrated in Samson's latest catalog. The catalog includes descriptions and specifications of not only the usual table appliances and irons but also such items as heating pads, room heaters, and rubber bladed fans. **Samson United Corporation, Rochester, N. Y.**

(16) G-E Refrigeration Booklet: To meet the particular needs of refrigerator salesmen covering the specialized apartment house field, General Electric has issued a new booklet designed to stress the factors making for a low maintenance cost and long service which are especially important in this class of business. In requesting copies of this publication please refer to No. 302-54. **General Electric Company, Bridgeport, Conn.**

(17) Fluorescent Lamp Guide: A practical guide to the application of Mazda fluorescent lamps and equipment has just been issued in a 23 page booklet. Answers are given for the many questions every lamp and lighting man is asked today about d-c operation, temperature effect in outdoor operation, color, stroboscopic effect, radio interference, and lighting costs. Ask for booklet A-3618. **Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.**

Catalogs and Bulletins Available to the Trade

A wide range of catalogs and other publications have been made available to the trade by the electrical manufacturers.

ELECTRICAL SOUTH will be pleased to assist you in obtaining copies of the publications that are of particular interest to you. Simply read through the descriptive items, noting the numbers of those that you want. Draw a circle around these numbers on the coupon below, pin it to your blank letter head, and mail to us. We'll see that you get the publications.

Editor, ELECTRICAL SOUTH,
1020 Grant Building
Atlanta, Ga.

Dear Sir: Please ask the manufacturers to send me copies of the booklets indicated below:

August, 1940: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Name _____

Address _____

City & State _____

MANUFACTURERS' News

Edwin L. Wiegand Company Holds Sales Conference

"Turn on the Heat With Chromalox" was the theme which set the pace for the three-day sales conference of the Edwin L. Wiegand Co., in Pittsburgh, Pa., on June 19, 20 and 21. The meeting, which was attended by thirty-five sales representatives from all parts of the United States and Canada, commemorated the 25th anniversary of the manufacture of the first Chromalox heating unit.

Edwin L. Wiegand, president, told the group how, twenty-five years ago, he was issued the first patent on the Chromalox unit and how during the following years the company has grown to be the largest concern in the United States devoting its facilities entirely to designing and manufacturing electrical heating units and equipment and whose products produce annually over $15,000,000 in revenue for the electric utility companies.

E. N. Calhoun, general sales manager, gave details of the new Super-Speed Chromalox and Heatflo Range Units and announced new merchandising plans to help accelerate the popularity of electric cooking.

M. M. Greer, manager of industrial sales, announced a number of new products, as well as a number of improvements in design in present products. D. A. Wolff, sales promotion manager, announced a new and broader schedule of trade paper advertising, supplemented by two new direct mail campaigns.

A study of the electric range and water heating business was presented by Bruce Fleming, who recently joined the Wiegand Company. He predicted that the industry would sell over 400,000 electric ranges this year and that electric water heating would have one of the best years in its history.

Dry Shaver Manufacturers Announce Promotional Plans

The electric shaver market may be on the threshold of considerably greater possibilities, judging from the activities of the Knapp-Monarch Company, of St. Louis, and Schick Dry Shaver, Inc., of Stamford, Conn. Both of these companies have announced comprehensive promotion plans.

Schick Dry Shaver has just announced the new hollow-ground 2-M cutter head and the 1941 Schick Shaver line fashioned by Raymond Loewy, famed industrial designer. Introduced to the trade on August 5 by special Western Union messengers, the new line will be backed by a tremendous advertising and sales promotion campaign, according to Kenneth C. Gifford, Schick vice-president in charge of sales.

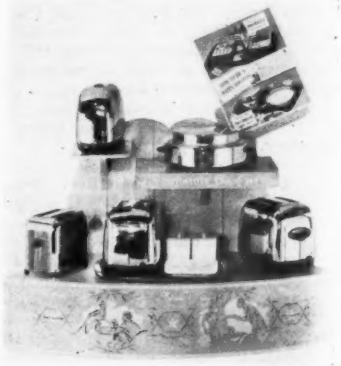
The big merchandising push will start off with a sustained consumer-advertising campaign consisting of 29 separate advertisements running in national magazines from Labor Day to Christmas. It is estimated that these advertisements will reach more than 70,000,000 readers in the 90-day period. They will be concentrated principally in the Saturday Evening Post, Collier's, Life, and The New Yorker magazines.

The Knapp-Monarch Company promotion will take the shape of a radio program with sole sponsorship planned for the Knapp Natural Angle Shaver. A. S. Knapp, president of the company, has just placed a contract for 45 NBC stations on a network that will cover the nation.

The Knapp radio program, called "Ahead of the Headlines," will broadcast an analysis of the news. Newsweek magazine will cooperate by lending its editorial authorities to the program.

Toastmaster "Snack Bar" Is Merchandising Aid

Determined to keep the Toastmaster sales curve zooming upward along the line marked by an unbroken succession of new sales records in recent years, officials of the McGraw Electric Company announced on July 19 a comprehensive merchandising and advertising plan to build fall and holiday trade to new high levels.



Characteristic of the completeness of the program, according to W. E. O'Brien, sales and advertising manager of the Elgin firm's domestic appliance division, is a new display-selling fixture called the Snack Bar, which is offered free to retailers in connection with one of several Profit-Builder assortments.

The Snack Bar holds a fine 5-piece assortment of Toastmaster products, insuring effective, traffic-stopping display in minimum space. It can be used on table, counter, or any other strategic location in the store.

Toastmaster executives are calling special attention to advertising plans for fall. Between Labor Day and Christmas, the entire Toastmaster line will be featured in the most extensive campaign in the company's history. Thirteen leading magazines will be used: there will be 12 pages in full color and 31 striking black and white advertisements—a total of 106,000,000 advertising messages.

The Edwin L. Wiegand Company, Pittsburgh, Pa., manufacturers of Chromalox electric heating units, celebrated the 25th anniversary of the manufacture of the first Chromalox unit with a meeting of their sales representatives from United States and Canada at a sales conference June 19 - 20 - 21.

INDUSTRY UNITES TO CAPITALIZE ON GREAT SALES OPPORTUNITY

ELECTRIC WONDERLAND—with every prospect an Alice, thrilled and delighted at the electric cooking marvels that you show her. That's The Modern Kitchen Bureau's Electric Range theme for the fall of '40—a NEW promotion with a NEW twist by which dealers, utilities and manufacturers coordinate nation-wide activity to capitalize on a great range sales opportunity.

Tie into it with everything you've got—and everything we give you! Use the powerful sales and advertising aids furnished by MKB—including the mystifying MAGIC MIRROR display. Participate in the big Alice in Electric Wonderland stage shows to be produced by local bureaus, electric leagues and utilities. Ride the tail of national advertising as it continues to push the electric range sales curve on to higher peaks.

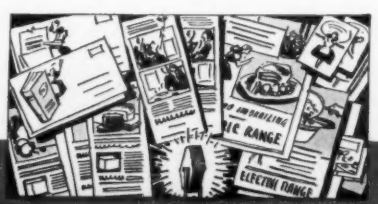
For further information, check your electric league, distributor, utility. Or write:

THE MODERN KITCHEN BUREAU
420 Lexington Avenue, New York, N. Y.

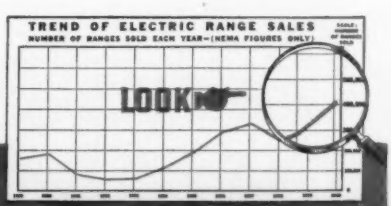
***FLASHER OFF**—prospect sees a perfectly reflecting mirror at which she can stop and primp.*

***FLASHER ON**—prospect sees "Through the Looking Glass," Alice at her range in Electric Wonderland.*

Electric Wonderland Demonstrations Give Range Selling floor-and-a-half stage shows—designed for joint dealer-utility selling—provide space for your own demonstration booth and let you share in large scale selling effort on dealer-capital stage.



Sales Promotion Material Promotions Your Advertising Every sales help from letterhead stickers and direct mail pieces to newspaper mats, radio spots and window display materials. Use it all and let it BOOST YOUR SALES!



Great Sales Opportunity For You. '39—'40—UP goes the Electric Range sales curve for '40, hitting a new all-time high. Get aboard the band-wagon. This biggest promotion in history helps you CASH IN NOW.

Estate • Frigidaire • General Electric • Gibson • Globe-American • Hotpoint • Kelvinator • Monarch • Norge • Stewart Warner • Universal • Westinghouse

Westinghouse Expansion At Mansfield Announced

The Westinghouse Electric & Manufacturing Company announced plans for construction of a $560,000 warehouse, bringing to $1,500,000 the cost of an expansion program now under way at its merchandising division headquarters plant in Mansfield, Ohio.

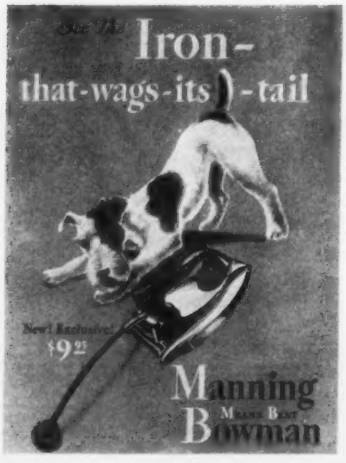
Work will start shortly on a warehouse providing 126,000 square feet of space. This will complete a program which began recently with the construction of a 1,000-foot industrial bridge, costing $150,000, which connects the vitreous enamel and main assembly buildings of the Mansfield plant.

The second major feature of the expansion program on which work now is in progress, is a new metal stamping building costing more than $500,000. Two floors are being added to one of the main buildings.

Bendix Sales of Home Laundry Units Up

According to word received from J. S. Sayre, vice president in charge of sales, Bendix Home Appliances, Inc., South Bend, Indiana, sales of that company's line of automatic washers for the first six months of 1940 were 292 per cent of sales for the same period of 1939.

"This very gratifying increase in our sales performance," said Mr. Sayre, "is largely as a result of a greatly improved product and an increased dealer organization, numbering 435 additional retail outlets selling Bendix as compared with 1939. That combination produced sales that enabled the factory to ship in the first six months of 1940, 114 per cent of the number shipped during the entire year of 1939."



Manning Bowman's newest electric iron, with cord directly attached, has the free-swinging, swivel action of a puppy's tail. In a five-color, electrical motion display card, pictured above, both dog's tail and iron cord wag simultaneously.

C. E. Mullin, Jr. **S. R. Sellers** **Robert I. Petrie**

News about People—

To promote the sale of products of the General Electric appliance and merchandise department to the farm market, a new farm sales section of the department has been formed at Bridgeport, Conn., with **George E. Mullin, Jr.**, as manager of the section, according to **C. M. Snyder** and **J. M. Crawford**, heads of the appliance and the construction materials divisions, respectively. Mr. Mullin has been a member of General Electric's rural electrification section for the past four years and, more recently, was associated with the electrical traveling exposition which toured the country under the sponsorship of the REA.

* * *

Two new executive appointments were announced recently by **Frank R. Pierce**, general sales manager, of Kelvinator Division of Nash-Kelvinator Corporation. **Charles J. Coward** has been appointed director of advertising and sales promotion of the Kelvinator Division, filling the vacancy left by J. Nelson Stuart, who

C. J. Coward

recently resigned to return to sales management work. For the past ten years, Mr. Coward has been occupied in various phases of advertising and sales promotion work. Since 1936 he has been with the Jones agency, where as account executive he has directed all phases of appliance advertising and sales promotion for NEMA.

Steele R. Sellers has been appointed sales manager of the electric range department of the Kelvinator Division. He succeeds Harry M. Parsons, who resigned to become sales manager for Landers, Frary and Clark. Mr. Sellers has been directly connected with the household appliance industry since 1916.

* * *

Lester R. Ward, of Dallas, Texas, was appointed direct factory representative in Texas and Western Louisiana for Edwin L. Wiegand Company, Pittsburgh, Pa., manufacturers of Chromalox electric range units and Chromalox industrial heating units and devices. For the past twelve years, Mr. Ward has served as assistant to the vice president in charge of sales of the Texas Power and Light Company, with headquarters at Dallas. He has just returned from the factory of the Wiegand company where he made an intensive study of the application of Chromalox heating units. Mr. Ward's sales agency has been established at 401 Southland Life Building Annex.

Lester R. Ward

* * *

The appointment of **Robert I. Petrie** as vice president and general sales manager of The Crosley Corporation was announced recently by **Raymond C. Cosgrove**, vice president and general manager of the manufacturing division of the corporation. Since 1938, Mr. Petrie was president and general manager of Barlow and Seelig Manufacturing Company, Ripon, Wisc. Previous to 1938 he was associated for more than 15 years with the Nash-Kelvinator Corporation serving as sales manager for both the Leonard Division and for the Kelvinator Corporation.

Every house needs Westinghouse

I'M ALICE IN Electric WONDERLAND—
HEADLINING YOUR NEW 1940 FALL
ELECTRIC RANGE PROMOTION
INDUSTRY UNITES TO CAPITALIZE ON GREAT SALES OPPORTUNITY

THE M. K. B. FALL RANGE DRIVE IS THE BIGGEST AND BEST EVER!

...AND WESTINGHOUSE HAS A TIE-IN PLAN THAT'S GOT EVERYTHING!*

*and we do mean EVERYTHING!

When you plan your "Alice in Electric Wonderland" electric range program this fall, be sure to include Westinghouse, the "Best Seller," for these TWO Big Reasons:

1. **You'll have a beautiful new range . . "The Harvester" . . . for fast fall selling.**
2. **You'll have another Westinghouse "Faster for '40!" Retail Sales Activity including:**

- **Twelve full page, full color ads in The Saturday Evening Post, Collier's, Life and Liberty.**
- **"Alice in Electric Wonderland" display *plus* other new display material.**
- **A "Give Away" that's a sure-fire traffic builder.**
- **Special fall newspaper advertisements.**
- **"Musical Americana" radio program every Tuesday night from coast-to-coast.**

The whole story will be told in FALL MERCHANDISE MARKETS to be conducted late this month by Westinghouse Distributors. Watch for the announcement and don't fail to attend!

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, DEPT. 195, MANSFIELD, O.

GET THE WHOLE STORY AT YOUR WESTINGHOUSE DISTRIBUTOR'S FALL MERCHANDISE MARKET, BEGINNING AUGUST 19.

Westinghouse *Electric* Ranges

"The Leisure Line"

TOASTMASTER *Offers*

THIS BEAUTIFUL, SALES-MAKING

Snack Bar

FREE with PROFIT-BUILDER No. 1

Buy just 5 items as displayed, and get the Snack Bar free, plus *extra profit* on the 4-slice toaster, specially priced. . . . Then watch the Snack Bar make sales jump! A *permanent* display—will last for years. Ruggedly constructed—not cardboard but solid cabinetwork; genuine knotty pine veneer background; beautifully and durably finished in oil and lacquer colors. Comes completely assembled, ready to *stop traffic* anywhere in your store. . . . A "must" for every *Toastmaster* dealer!

SELECT YOUR OWN ASSORTMENTS

Never before has *Toastmaster* offered retailers such an opportunity to cash in on *Toastmaster* products *of their own selection*—in small sample assortments of the fastest-selling appliances in the field. Of three great Profit-Builders available now, *two* allow an option of either the 2-slice *Toastmaster* automatic toaster or the Waffle Service *at a special low price.* And the Dealer's-Choice Profit-Builder leaves the entire selection of six items *up to you!* Here's your chance to build up a balanced stock, make extra profit, and attract new customers. . . . And remember—the greatest Fall advertising campaign in *Toastmaster* history will be backing you up. Between Labor Day and Christmas your customers will see 43 separate *Toastmaster* advertisements—12 of them being pages in full color. . . . Be ready for the Fall demand, with Profit-Builder stocks ready, Snack Bar waiting to go, and extra profit coming up! Call your distributor, or write us for full details. Don't delay—the time is short!

ACT NOW FOR EXTRA PROFIT!

3 Great PROFIT-BUILDERS

IDEAL ASSORTMENTS FOR EXTRA PROFIT!

PROFIT-BUILDER No. 1 consists of:

1 2-slice Automatic Toaster — 1 Junior Non-Automatic Toaster
1 De Luxe Toast 'n Jam Set — 1 Automatic Waffle Baker

With your order for these four items you get one 1-slice Automatic Toaster (list, $9.95) at the *special price* of $4.00 net; and, in addition, one Snack Bar FREE. Limit: Only one Snack Bar to any one retail outlet.

PROFIT-BUILDER No. 2 consists of:

1 1-slice Automatic Toaster
1 De Luxe Toast 'n Jam Set
1 Junior Toast 'n Jam Set

With your order for these three items you are entitled to a choice of either the 2-slice Automatic Toaster (list, $16.00) or the Waffle Service (list, $16.95) at the *special price* of only $7.50 net.

PROFIT-BUILDER No. 3 consists of:

1 1-slice Automatic Toaster — 1 De Luxe Hospitality Set
1 Automatic Waffle Baker — 1 Junior Toast 'n Jam Set
1 Standard Hospitality Set — 1 De Luxe Toast 'n Jam Set

With your order for these six items you are entitled to a choice of either the 2-slice Automatic Toaster (list, $16.00) or the Waffle Service (list, $16.95) at the *special price* of only $5.00 net.

DEALER'S-CHOICE PROFIT-BUILDER

(Available only to purchasers of Profit-Builder No. 3)

For every Profit-Builder No. 3 that you buy you are also entitled to purchase *one* Dealer's-Choice Profit-Builder. This consists of *any six items* of your own selection, plus your choice of either the 2-slice Automatic Toaster (list, $16.00) or the Waffle Service (list, $16.95) at the *special price* of only $5.00 net.

IMPORTANT: Not more than a total of 12 Profit-Builders to any one retail outlet

NEW SETS • NEW FEATURES NEW SALES-APPEAL

DE LUXE HOSPITALITY SET

Newly styled, gracefully contoured walnut tray. Four appetizer dishes in heavy Imperial crystal, the new smart vogue. Four lap trays. $23.95

STANDARD HOSPITALITY SET

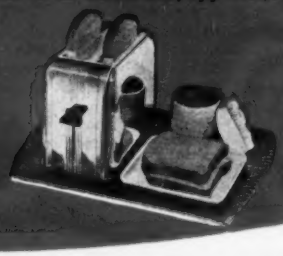
Four appetizer dishes of colorful Franciscan Ware, a quality pottery never before used on this set. New, large, beautiful walnut tray. $19.95

WAFFLE SERVICE

Unsurpassed display value. Handsome, spacious walnut tray; batter bowl and syrup pitcher of Franciscan Ware; lifetime chromium ladle. $16.95

JUNIOR TOAST 'N JAM SET

Has toast plate, an exclusive feature, and covered jam jar, in Franciscan Ware, same as new De Luxe Toast 'n Jam Set (shown on Snack Bar, opposite). $8.50



TOASTMASTER

REG. U.S. PAT. OFF.

Call your distributor or write: McGRAW ELECTRIC COMPANY

Toastmaster Products Division, Elgin, Illinois

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SPECIAL OFFER ENDS AUGUST 31, 1940

Several Westinghouse lamp executives were promoted by appointments made recently by **C. S. Youngholm**, vice president of the Westinghouse Electric and Manufacturing Company.

A. E. Snyder, former general sales manager, was appointed assistant general manager of the Westinghouse lamp division. Mr. Snyder, who will make his headquarters in New York, joined Westinghouse in 1909 and has been associated with the company continuously since that time.

B. H. Sullivan, former manager of the lamp division's middle western district with headquarters at Chicago, will succeed Mr. Snyder as general sales manager, with headquarters in New York. Mr. Sulivan first became associated with Westinghouse in 1922 and has served as manager of the southeastern district office and the middle western district office.

Leon S. Paletou, former manager of the lamp division's southern district with headquarters in Atlanta, has been named manager of the middle western district at Chicago. He has served Westinghouse in various capacities since 1916 and became manager of the southern district in 1927.

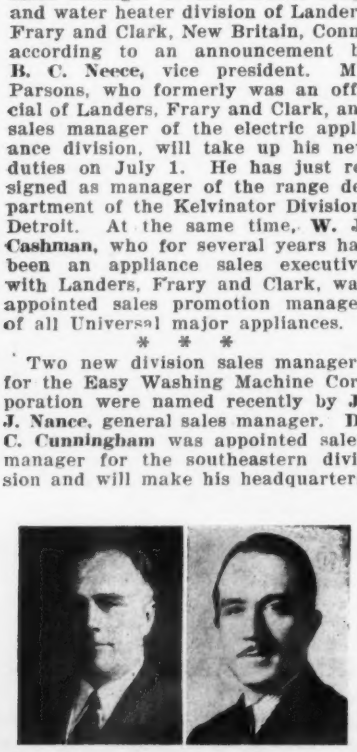
Succeeding Mr. Paletou as manager of the southern district is **Charles A. Conklin**, who was manager of automotive products sales. Mr. Conklin has been associated with the lamp division continuously since 1922. He became Detroit branch manager in 1928, which position he held until transferred to New York as manager of automotive products in 1938.

* * *

H. M. Parsons has been appointed sales manager of the electric range and water heater division of Landers, Frary and Clark, New Britain, Conn., according to an announcement by **B. C. Neece**, vice president. Mr. Parsons, who formerly was an official of Landers, Frary and Clark, and sales manager of the electric appliance division, will take up his new duties on July 1. He has just resigned as manager of the range department of the Kelvinator Division, Detroit. At the same time, **W. J. Cashman**, who for several years has been an appliance sales executive with Landers, Frary and Clark, was appointed sales promotion manager of all Universal major appliances.

* * *

Two new division sales managers for the Easy Washing Machine Corporation were named recently by **J. J. Nance**, general sales manager. **D. C. Cunningham** was appointed sales manager for the southeastern division and will make his headquarters in Atlanta. He was formerly manager of the company's midwestern and northern divisions. **I. W. Shipp** has been promoted to the post of sales manager for the southern division. For five years Mr. Shipp served as assistant to the southern divisional sales manager.



D. C. Cunningham I. W. Shipp

* * *

Martin D'Arcy has been named sales representative for the Arrow-Hart and Hegeman Electric Company, Hartford, Conn., according to an announcement by **H. J. Fonda**, southwestern district manager, Dallas. Mr. D'Arcy, who was formerly with Economy Fuse Manufacturing Company, will cover Louisiana, Mississippi, Alabama, Tennessee and part of Florida with headquarters in New Orleans.

Martin D'Arcy

* * *

Hawkins and Hagen Electric Sales Company, well known manufacturers' representatives of St. Louis, Mo., have been appointed sales representative for the Chase Shawmut Company, of Newburyport, Mass., for their territory, according to an announcement by **R. V. Hawkins**.

* * *

The Domestic Refrigeration and Laundry Equipment Department of the Westinghouse Merchandising Division have been combined into a single department, according to announcement by **F. R. Kohnstamm**, merchandising division sales manager. **T. J. Newcomb**, heretofore manager of the domestic refrigeration department, has been named manager of the new department.

* * *

E. W. Simons, president of Pittsburgh Reflector Company, has just announced the election of the following new officers and directors:

John A. Hoeveler, manager of the engineering department since 1926, has been named first vice president and member of the board.

W. K. Yonge, who began service with Pittsburgh Reflector Company as plant superintendent 21 years ago, has been named vice president in charge of manufacturing.

H. C. Zinesmeister, auditor since 1934, has been appointed treasurer and a member of the point.

R. C. Fiske, who has served for the past several years as secretary to the president, was promoted to secretary and elected a member of the board.

Farm Home Refrigerator

Announcement of a specially-equipped, 8.2 cubic-foot refrigerator, designed specifically for the farm home, is made by the Kelvinator Division of Nash-Kelvinator Corporation. The new model, built to provide rural homes with refrigeration flexible enough to hold large articles such as a five-gallon milk can and a tub containing 20-dozen eggs, incorporates five half-length shelves, any or all of which can be removed. It has a metal-reinforced rubber mat to protect the floor of the food compartment when milk cans or other heavy containers are used.

The interior of the new Kelvinator floor model is finished in porcelain and the bottom is acid-resisting. Shelves are heavily-tinned to retain their brightness indefinitely. With all shelves in place there is 16.3 square feet of shelf area available. With one or more shelves removed in this new model, there is space to store almost anything that might need refrigeration—plus extra unrefrigerated space for a bushel and a half in the vegetable bin.

G-E Portable Ironer

A new rapidly performing electric ironer of the rotary type, so light in weight that it may be carried easily and used on any convenient work surface, has been announced by the General Electric appliance and merchandise department, Bridgeport, Conn., to supplement the line of G-E washers, ironers, and dryers.

The quality of the work possible with the new device compares favorably with that of the larger machines.

DOUBLE USE

J-K CLAMP BOXES

The J-K Cable Box with *external* clamps was designed by Raco • All-Steel to conserve space *inside the box* for additional conductors and splices. This is especially important when you consider that the National Electric Code restricts the number of wires that can be used in a box to a definite ratio to its cubic capacity.

A *smaller* J-K Box with external clamps can be used more efficiently than a *larger* conventional box with internal clamps. No space is wasted inside the J-K Box.

USED WITH BOTH TYPES OF CABLES

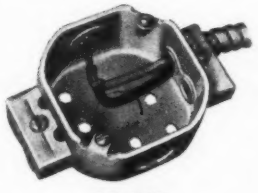
FOR METALLIC CABLES—The J-K Box has 2 *bushed* openings as required by the Underwriters, to protect the conductors from injury. The cable is held securely by a strong clamp in the housing, while the 2 Pri-outs are easy to remove.

FOR NON-METALLIC CABLES—The J-K Box has a unique arrangement adapting it for use with Non-Metallic Cables. Good wiring practice requires that Non-Metallic Cables be gripped well back from the cut and frayed end of the cable sheathing. We afford this facility by a K.O., which entirely surrounds the bushed openings required for the installation of Metallic Cables.

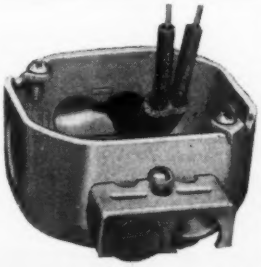
One Box—2 Services—Double Use

FOR BOTH TYPES—The J-K Box is equally suitable for, and can be used interchangeably with, either metallic or non-metallic cables—or both types in the same box if desired.

The J-K Box was developed and pioneered over a period of years by RACO•ALL-STEEL, during which it gained an ever-increasing NATIONAL ACCEPTANCE. And although it may be copied, no imitation could serve the same wide range of utility as the genuine J-K Box!



J-K BOX
USED WITH METALLIC CABLE



J-K BOX
USED WITH NON-METALLIC CABLE

Genuine J-K Boxes are protected by U. S. Patents, No. 2,000,850 and No. 2,000,851. Other patents are pending.

Jobbers: With the J-K Box, you can supply your trade with an appropriate type clamp box for either metallic cable or non-metallic cable or both.

Made in 2 sizes (3¼″ or 4″) octagon, with or without fixture studs—black or galvanized. *Assembled on bar hangers if desired.*

The J-K Box is only one of many nationally famous RACO • ALL-STEEL • ELECTRICAL PRODUCTS. Write for catalog—you will be under no obligation to learn about these better products with their many advantages for rural and urban modernization work, as well as on new jobs.

Distributed nationally by

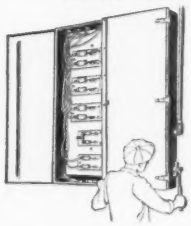
ALL-STEEL-EQUIP COMPANY
INCORPORATED
208 Griffith Avenue, Aurora, Illinois
Factories: **South Bend, Ind.; Aurora, Ill.**

RACO • ALL-STEEL • PRODUCTS
Switch Boxes • Outlet Boxes • Cutout Boxes • Cabinets • Conduit Fittings
Distributors in All Important Centers

How To Save Hours Of Hard Work On Each Job . . . . . .

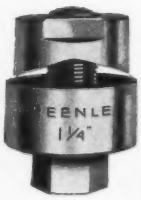
Greenlee Knockout Tools have been developed to do the job of enlarging holes easily in a few minutes. The hours of drilling, reaming, and filing, formerly required to enlarge holes on the job, are no longer necessary. These tools make the job so simple that a clean round hole to fit conduit up to 3-inches can be cut in a couple of minutes or less, by merely turning a drive nut with an ordinary wrench.

Greenlee Knockout Tools



The drawing at the left shows just one of the many uses of the Greenlee Knockout Tools.

The Greenlee Knockout Punch is made in various sizes to enlarge holes for conduit from ½ to 3-inch. Cutting is done by a two point punch, driven by screw action through the metal into a die of proper size.



The Greenlee Knockout Cutter shown here will enlarge holes to fit 1-1/2, 2, 2-1/2, and 3-inch conduit. This tool will cut easily through metal up to 1/8-inch thick in about 1-1/2 minutes.

WRITE FOR COMPLETE DETAILS

GREENLEE TOOL CO.
1707 Columbia Ave.
ROCKFORD, ILLINOIS

It is designed with an open end for convenience, and its roll—6 inches in diameter and 22 inches long—lends itself to the ironing of sheets, tablecloths, towels, shirts, dresses, and other garments.

The new ironer, model AR-17, weighs 33 pounds, and its weight is evenly balanced. A one-piece welded steel base with trim lines, rounded corners, and protective rubber bumper band combine with the white finish to make an attractive appliance. The shoe has a duo-chrome finish, and 110 square inches of ironing surface. Instantaneous control is provided by a single lever for all operations, which starts and stops the roll and serves as a pressing control.

Cory De Luxe Tray Set

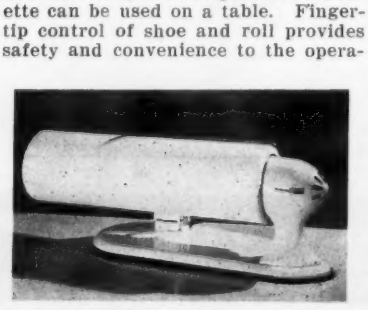
A recent survey by a well-known woman's magazine indicated that well over 50% of the electric coffee makers in use were received as gifts to fill the demand for something "extra fine" in a coffee brewer and tray combination. Cory now offers the Royal DeLuxe tray set. The

tray of exclusive Cory design, is equipped with a Cory Royal coffee brewer, and dainty glass cream pitcher and sugar bowl, hand decorated with platinum striping to match the brewer. The tray is beautifully carved from genuine birds eye maple, and is given a special high-gloss finish impervious to moisture and stain. Four deep compartments provide for hors d'ceuvres, jam, crackers, relishes, cakes and sweets . . . the refreshments served with hot coffee or tea.

Hotpoint Portable Ironer

Retailers of home laundry equipment and homemakers with limited laundry space, will welcome the announcement of the new Hotpoint "Priscillaette"—a light-weight portable electric ironer. Easy to handle and to store, the Hotpoint Priscillaette can be used on a table. Fingertip control of shoe and roll provides safety and convenience to the operator, while the automatic heat control gives flexibility in ironing various fabrics of different weights. The 22-inch roll will accommodate all kinds of clothes and household linens.

The shoe and the roll operate simultaneously by moving the control lever toward or away from the operator. A pressing button, in the control ball, starts or stops the roll independently of the shoe, for pressing pleats, creases, and heavy thicknesses of material. This extra control is also convenient when ironing into difficult corners of garments. Rated at 1,275 watts, the Hotpoint Priscillaette is designed to operate on 110 volts.



Multi-breaker Enclosure

The Square D Company, Detroit, Michigan, announces a raintight enclosure for the 25-ampere frame type MO Multi-breaker. This enclosure is

When in St. Louis make your visit a comfort success! Stay at Hotel Lennox.

Relax in a guest-controlled air-conditioned room . . . enjoy fine food and drink in cool restaurants. Bath, radio, icewater in every room. Convenient parking at this downtown AAA hotel.

Rates . . . 50% of all rooms, $3.50, or less, single; $5.00 or less, double. Special rates for families.

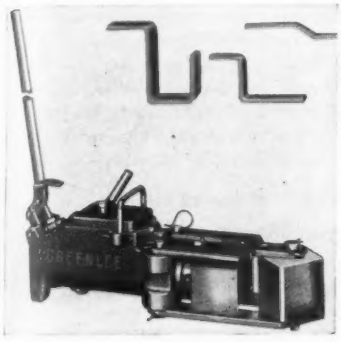
COMPLETELY AIR-CONDITIONED
HOTEL
Lennox
9th & Washington • St. Louis, Mo.
Nearby Parking and Garages

a galvannealed steel hood which can be used to enclose any standard surface type MO Multi-breaker. The cover is removable for easy wiring. Outside dimensions are 7" high, 4½" wide and 3⅞" deep. There is provision for padlocking the cover.

The raintight hood and the surface type MO Multi-breaker are furnished as separate units. Catalog No. R14 is the raintight enclosure without a hub, listing at $1.50. Catalog No. RD14 is the raintight enclosure with a 1" hub in the top end-wall, listing at $2.15. A porcelain bushing is furnished with Catalog No. RD14 for placing in the knock-out removed from the type MO Multi-breaker box.

Hydraulic Bus-Bar Bender

Greenlee Tool Co., Rockford, Illinois, announces the addition of a bus-bar bender to the Greenlee line of hydraulic benders for rigid conduit, pipe, and thin-wall steel tubing.

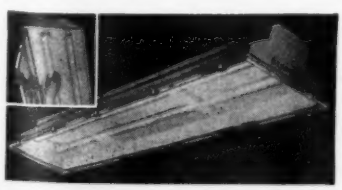


The tool illustrated here, No. 770-BB, consists of the standard power unit of the No. 770 and No. 700-T Conduit Benders, fitted with the bus-bar bending attachment. The complete tool can be had as shown or the attachment can be purchased separately for application to those benders now in use.

This bender will handle bars up to 4" wide and ¾" thick. Accurate U-bends of any size can be made, ranging upward from the small 'U' with a 3½" inside width.

Benjamin "Sealed-Flo" Units

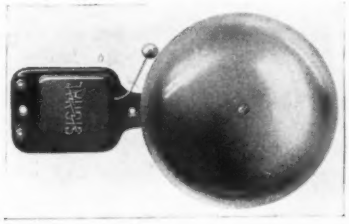
The new Benjamin "Sealed-Flo" units feature a new sealed cover construction which not only protects the fluorescent lamps and reflecting surfaces from dust and dirt, thus reducing cleaning and maintenance costs, but also extends the use of fluorescent lighting to locations requiring vapor-proof and dust-tight fixtures, opal glass diffusing fixtures or "unbreakable" glass protection of lamps and reflecting surfaces.



In announcing the new units, the Benjamin Company states, "Through the new 'Sealed-Flo' units, the advantages of fluorescent lighting for both general and localized illumination can now be provided for locations where lighting equipment is subject to even the most adverse atmospheric conditions such as steam, dampness, non-combustible dusts and vapors. These units provide the same high levels of glareless light with softly luminous shadows as the Benjamin RLM Stream-Liter fluorescent units and, in addition, are rated as vapor-proof by the Underwriters' Laboratories."

Signal Alarm Bell

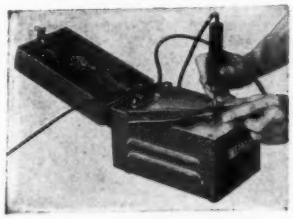
A universal vibrating bell, made in three sizes, for use as burglar alarms, call signals and elevators, is announced by Signal Electric Mfg. Co., Menominee, Michigan. This



large bell is non-adjustable, with double coil construction, and operates on either 1½ to 3 volt battery or with bell ringing transformer. The gong is nickel, with base and cover of drawn steel. Standard finish is black enamel. It is really a big bell at a small list price, the list prices being $1.60 for 5"; $1.80 for 6" and $2.80 for 8", sold through jobbers.

Streamlined Electric Etcher

Everything safely enclosed and out of the way is the outstanding feature of the new and modern portable No. 13 "Universal" Electric Etcher just announced by the Ideal Commutator Dresser Co., Sycamore, Illinois. The etcher tool and cords, switch and indicator lamp are all "under cover." Small objects are etched right on the



work plate which makes up part of the case while a ground clamp is furnished for larger objects. The cover is removable if desired.

Etching heats are 120, 240, 420 and 700 watts—a red indicator lamp burns brighter as the hotter heats are turned on. There's plenty of "zip" for permanently marking tools, parts, dies, bearings, saws, drills, products in production and finished

NEW { FEATURES MODELS PRICES

A COMPLETE NEW LINE OF

"AUTOMATIC"

TIME SWITCHES

NEW FEATURES - - - -

Windows in all cabinets...Visable dial... Visable trip levers!

New "streamlined", gray, steel cabinets!

Motor-operation indicators!

Visible—Contact—Position inspection!

Optional "dead-front" terminal panel!

Removable dial for easy setting of trip levers!

Interchangeable dials for one or two sets of trip levers!

Manual Control on all models; simple in design and operation!

Padlockable, tamper-proof cabinet hasps!

Synchronous, self-starting motors with normal operation down to 20 below zero!

New type trip levers . . . Bright for ON . . . Black for OFF!

Two portable, plug-in models with extension cord and receptacle requiring no installation!

Settings as close as 15 minutes between ON and OFF . . . With two sets of trip levers, next ON operation as close as 1-3/4 hours!

Sunday and Holiday Cutout standard on all 45-ampere models!

More compact size . . . more attractive appearance . . . Complete range from 7 to 45 amperes . . . Single-pole and double-pole models . . . One and two circuit types!

Here Are A Few

NEW MODELS—NEW PRICES—

45 Amperes . . . Double Pole . . . $20.00
45 Amperes . . . Single Pole . . . $18.00
30 Amperes . . . Double Pole . . . $15.00
30 Amperes . . . Single Pole . . . $13.00
20 Amperes . . . Single Pole . . . $12.00

Portable, Plug-in Models

10 Amperes . . . Single Pole . . . $11.50
7 Amperes . . . Single Pole . . . $10.50

Write For Information

AUTOMATIC

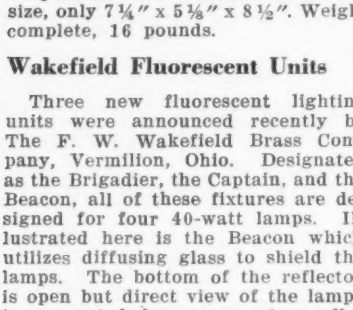
Electric Manufacturing Co.

MANKATO • MINNESOTA.

parts. Writing is as easy as with a pencil yet the marking is clearly and permanently burned into the metal. The standard unit is for 110 volt, 60 cycle, a-c. Other voltages and frequencies are available. Overall size, only 7¼" x 5⅛" x 8½". Weight complete, 16 pounds.

Wakefield Fluorescent Units

Three new fluorescent lighting units were announced recently by The F. W. Wakefield Brass Company, Vermilion, Ohio. Designated as the Brigadier, the Captain, and the Beacon, all of these fixtures are designed for four 40-watt lamps. Illustrated here is the Beacon which utilizes diffusing glass to shield the lamps. The bottom of the reflector is open but direct view of the lamps is prevented by means of parallel louvers. Four lamps are mounted on a curved metal reflector in which is housed the necessary auxiliary equipment.



Industry News

(*Continued from page* 32)

Supply Co., Moore-Handley Hardware Co., R. P. McDavid & Co., Birmingham Electric Battery Co., Steel City Appliance Co., Stewart-Warner Distributing Corp., and Nash-Kelvinator Corporation.

The association sent out all mailing pieces relative to the campaign in paper bags. The first bag which went out had the words "This is the Bag" in red letters on the outside and nothing inside. Other bags arrived later to give the details and to keep salesmen and dealers informed of the progress of the sale. Finally prizes and commission checks arrived in paper bags.

Only new appliance sales counted in the contest, reported Orville A. Reed, secretary-treasurer of the association and also in charge of dealer cooperative sales for the Alabama Power Company.

Band Width Measure of Regulator Efficiency

(*Continued from page* 29)

this small time delay is so pronounced, and the evaluation of anything like a two volt difference in band width is so high, that it is evident that the instantaneous responding regulator may be expected to have a significant advantage from the standpoint of effective band width of voltage held.

In this connection, early last year Mr. John Bankus of the Portland General Electric Company presented to the Apparatus and Design Subcommittee, of the Northwest Electric Light and Power Association, performance charts obtained with induction and step-type regulators. Three of these charts, taken at feeder load centers, are reproduced in Fig. 4.

Chart A is typical of three sets of charts obtained with single-phase induction regulators, in all three of which the voltage throughout the 24-hour period is held within substantially a two-volt band width. No chart taken on other than induction regulators showed the voltage within less than a 3½-volt band. Charts B and C were obtained with three-phase, ⅝ per cent step-type regulators and they show an effective band width of 3½ to 4 volts.

Size of Step

Obviously the size of the step in a step-voltage regulator may determine the closeness with which the contact-making voltmeter band width can be set, and thus will be effective in determining the band width of voltage which can be held.

The band width of voltage held may be influenced by effects of frequency, wave form, temperature, and other variations in operating conditions on the accuracy of the voltage-regulating relay.

While the integrated frequency on most power systems is held very exactly, all systems are subject to continual fluctuations of instantaneous frequency. The instantaneous frequency on the larger systems varies in the order of plus or minus one-fourth of a cycle, although some of the larger systems have been found to vary as much as plus or minus one-half cycle. Smaller systems vary up to plus or minus two or more cycles.

Let us consider the large system with plus or minus one-quarter cycle variation. This will cause a change of plus or minus one-half volt in the voltage level held by a voltage-regulating relay, in which the voltage held varies directly with frequency. This will widen effectively the band width of voltage held by one volt as compared with the voltage which would be held by a

All Keyed-up over . . .
LC SMITH
You will be too when you see it! Beautiful in appearance, easy to operate, new typing aids save time and energy. Automatic margin set. New concealed touch selector. New line space mechanism. New card holder. Plus the time proven floating shift, interchangeable platens and other features. Free demonstration at
The new Super-speed
L. C. SMITH & CORONA TYPEWRITERS, INC.
701 E. Washington St., Syracuse, N. Y.

regulator with no frequency error. Thus a regulator without frequency error possesses a significant economic advantage over one with frequency error.

Temperature errors or any other errors in the performance of the voltage-regulating relays result in an effective increase in the band widths of voltage held, and thus assume large economic importance.

Conclusion

The value of a regulator should be judged above all else by the job of voltage regulation it will do. Losses, exciting current, noise and the like deserve their proportionate valuation. However, a device can be produced which will have zero loss. It will have zero exciting current. It will be absolutely quiet. It will require no maintenance. It will have an extremely low first cost. It will occupy very little space. It will last practically forever. But it will not regulate voltage. *The prime function of a voltage regulator is to regulate voltage, and the prime characteristic to be evaluated when applying regulators is the degree of perfection with which the device performs this function.*

Connecting Diagrams For Lap Wound Motors

(Continued from page 26)

phosphor copper generally used for this type of brazing is around 750 to 850 degrees Centigrade. Excessive temperatures must be avoided or the bonding material will be ruined.

Silver solder is also used to some extent but it requires more care and is a bit more expensive. The work must be clean, a strip of silver solder a bit larger than the joint area is applied, the joint is fluxed with a thin paste of borax, and to make the solder flow along the edges of the joint it should be sprinkled with dry powdered borax. The joint should be heated to 750 to 850 degrees Centigrade and pressure applied while the solder flows and until it cools.

Regardless of what method is used, all joints should be mechanically and electrically good, as a poor joint will soon cause trouble and ruin a good winding.

The next article of this series will present the last of the eight-pole diagrams and will also include some data on the NEMA insulation symbol indexing system.

Applying the National Electrical Code

(Continued from page 23)

However, this does not apply to motor branch circuits. Since the largest fuse made is a 600 ampere size, any motor branch circuit requiring anything larger than 600 ampere protection must have a circuit breaker installation. To use fuses in multiple we must be sure that our circuit protection exceeds that available of the largest size fuse made. Thus, two 300 ampere, or two 200 ampere, or two 30 ampere fuses canot be used in multiple, since there is available a 600 ampere, or a 400 ampere or a 60 ampere fuse. However, for a circuit requiring 800 ampere protection, two 400 ampere fuses in multiple may be used as there is not available a standard 800 size fuse. It should be noted that only equal capacity fuses can be installed in multiple. The fuses under all conditions must be of the enclosed type. Finally, the fuses must be mounted in holders attached to a single continuous pair of bus bars or any similar arrangement which will definitely eliminate any potential difference between the fuse terminals.

A recommendation for the 1940 code would eliminate the use of time lag fuses in multiple.

1940 Conductor Capacities

(Continued from page 19)

larger size conductor of Type R or Types RP, RPT, RU, or SN must be used, or a No. 14 conductor of Type RH or RHT must be used. For all other combinations either larger size conductors of Types R, RP, RPT, RU, or SN must be used or conductors of Types RH or RHT must be used.

In the case of branch circuits from 3-phase, 4-wire systems the conditions are somewhat different. In this case a 3-wire circuit includes a conductor from each of two phases and a common conductor. This common conductor is not, however, considered as a neutral conductor so far as current-carrying capacities are concerned, for when the conductors connected to the phase wires are fully loaded, the common wire carries the same current as is carried by the other conductors.

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No. 1680
● PORCELAIN KEYLESS RECEPTACLE For 3¼" Box
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See Your Jobber Now or Write Us for Samples and Prices
KNOX PORCELAIN CORPORATION
KNOXVILLE, TENNESSEE

The allowable carrying capacity for various combinations are shown in Table C.

For one 2-wire, 15-ampere branch circuit, No. 14 Type R wire can be used, but for two, three, or four 2-wire, 15-ampere branch circuits in a raceway, either No. 14 Type RH or RHT wire must be used or a larger size Type R, RP, RPT, RU, or SN. For one 3-wire, 15-ampere branch circuit a No. 14 Type R wire can be used, but for two or three 3-wire branch circuits either No. 14 Type RH or RHT wire must be used or a larger size of Types R, RP, RPT, RU, or SN. For one 4-wire circuit a No. 14 Type R wire can be used, as the common wire becomes a neutral within the intent of the rule, but for two 4-wire circuits Types RH or RHT or a larger size of Types R, RP, RPT, RU, or SN wire must be used.

This data as applied to branch circuits is shown in Tables D and E.

Dramatic Demonstrations Feature Range Campaign

(*Continued from page* 14)

tional advertising in *McCall's Magazine* and *Better Homes and Gardens*, which commenced in January, will continue through the rest of the year.

The Bureau's fall electric water heater campaign will rest on the capable, proven shoulders of Donald Duck, that entertaining product of Walt Disney's imagination who has been so effective in the spring water heater campaign. A complete new series of promotional materials built around Donald Duck and his new motto—"Take It Easy with the Luxury of Low Cost Electric Water Heating"—will be provided by the Bureau.

Among these new materials is an attractive window banner, counter and display cards, direct mail pieces and spot announcements for radio. The national advertising program in *Better Homes and Gardens*, now in effect, will continue through December.

A special window display contest for water heater windows will offer substantial cash prizes to successful contestants. Photographs of windows to be entered in the contest are virtually the only requirement. There will be an essay contest for salesmen running through the second half-year, on the subject: "The toughest electric water heater sale I ever made."

Western Round-Up Corrals Profits

(*Continued from page 15*)

in stock illustrations of the various items, giving each a number, and creating an index which lists, not the *price* of each item, but the *number of contest points* necessary to obtain each item.

The price in contest points is established by the contest manager in this manner; in such a contest, if quotas are not unreasonably high, an average of about 40% of the men will end up over quota. They will average exceeding quota about 15% for the overall period of the contest, though there will usually be one or two just 5% or so over, and one or two that will hit 25% or even 50%. But the average will be about 15%.

On a six months' run, or twenty-six weeks, quota for the period will naturally be 2600 points, at 100 points a week for 100% of quota. Thus, if a man is over quota 15%, he will probably end up with about 3000 points, or 400 points to the good. Since a $10 prize is about the least a man should receive for keeping above quota for that length of time, the prize points, which are the points each man has in excess of quota, should be evaluated by the manager at 2½c each. That means that an article costing him $10 at the store should be listed in the prize catalogue at 400 points, and so on.

If the budget is larger, the points can be figured at 3c or 4c or even 5c each, making the contest that much more worthwhile to the men. This point should be emphasized: keep monetary values out of it, out of the catalogue and out of conversation. The prizes in the catalogue should establish themselves in the men's minds as requiring so many *points*, rather than so much money, which in turn will translate itself into so many sales.

The catalogue should be made up as attractively as possible, and hung by the scoreboard in the main office or show room, available to all the men at all times. This keeps the incentive before them constantly.

Needless to say, the Western Round-Up Contest offers limitless opportunities for promotion during the run, and they should be harnessed to the utmost. The house organ should be first-class; a clever design showing a cowboy riding a bucking bronc, or bulldozing a steer, should be mimeographed or planographed for the head, and some good, spirited, slangy copy written each week.

Salesmen who are under quota should be listed as "tenderfeet," those who are over quota are "bulldozers," and the one or two leaders can be called the "top-hands." A lost sale becomes a "maverick" or a "stray"; a good prospect is a calf or a yearling, while sales of used merchandise or sales where the net profit was not up to par become "dogies." Someone who can write in the Western vernacular should do the job of getting up the house organ each week.

Another vehicle of keeping interest up during the contest is the monthly "branding." This, in addition to being an interest stimulator

CASH
for
Trade-In
Vacuum Cleaners
Talley Vacuum Cleaner Co.
510 S. Tryon St.
Charlotte, N. C.

MEET ME IN ST. LOUIS
I'm Jimmie, the bike-riding chimp, at our big Zoo. Famous Muny Opera, major league baseball are other St. Louis attractions.
And be sure to stop at Hotel Mayfair. Relax in a guest-controlled air-conditioned room . . . enjoy fine food and drink. Bath, radio, ice water in every room. Convenient parking at this downtown AAA hotel.
Rates . . . 50% of all rooms, $3.50, or less, single; $5.00 or less, double. Special rates for families.
COMPLETELY AIR-CONDITIONED
HOTEL
Mayfair
Eighth & St. Charles • St. Louis, Mo.
Nearby Parking and Garages

for the salesmen, can secure valuable publicity for the store. At the end of each month, the sales totals should be tabulated, and the low man and the high man called on to participate in the branding.

This can take several different forms, the most used ones being to dress the two men in cowboy regalia and have the high man, riding a horse, lead the low man, mounted on a burro or donkey, through the main streets of town. Appropriate signs can be made, to be tied to the animals or carried by other salesmen: "I Loafed Last Month" or "I Left the Corral Gate Open," or something of the sort.

With this sort of procession started from the store, and the rest of the salesmen on hand, sufficient amusement and excitement can be depended upon. The activity itself on Saturday afternoon will be a good advertisement for the store, and the local newspaper can always be depended upon to publish a photograph if notified in advance. Other variations are to make the low man throw and brand a calf at the main intersection of town, or to give the low man a stamp and pad and have him attempt to "brand" the high man. The costumes can be rented cheaply, or sometimes borrowed. At the wind-up of the contest, some sort of party or dinner is a good idea, with the costume idea being applied as much as possible.

The scoreboard should also be as attractive and graphic as possible, having a space for each week's work, in which is entered the number of cattle each cowhand lassoed that week.

A contest of this sort, running over several months and properly merchandised to the participants, will institutionalize itself, will become a part of the daily working thought of the salesmen. It will become a permanent and subconscious tonic and incentive, both to increased sales efforts, and in increased loyalty to the firm. It will cost some money, but it will do a job in ratio to the money spent. If a man with a $200 weekly quota goes 15% over his quota for six months, that's about $800 worth of extra business. That's worth a $10 or $15 bonus, isn't it? And if some man hits the jackpot and goes even 50% over quota, you can afford to buy him a suit of clothes in return for $2500 worth of extra sales, can't you?

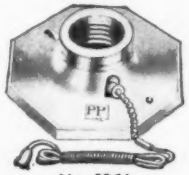
When the contest is over and the pay-off comes, the men should make their prize selections from the catalogue according to the number of points they have to spend, and turn in their selections to the manager, who should then have all the prizes delivered to the store, and awarded personally; it is always well to make a ceremony of the prize awards. If a dinner or party culminates the contest, this is the occasion for the prize awarding, and this is a much better way of handling the awards than to give them gift certificates or due bills and send them to the store themselves.

Business Trends

(Continued from page 5)

May was also the most active month ever recorded under the FHA program for homes actually started under its inspection. A weekly average of about 3,800 new homes started in May compares with about 3,700 in April, and 2,900 in May, 1939.

No. 8314



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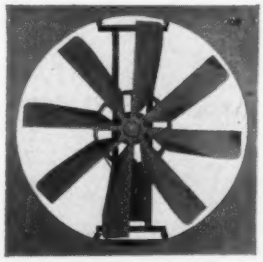

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AMERICAN COOLAIR CORPORATION
Manufacturers . . . . JACKSONVILLE, FLORIDA

FREDERICK STOKERS

Sell themselves

when prospects get the "inside story"!

Simplicity of design tells a story of "fool-proof" operation —says, "Here's a stoker you can install and forget!" And—with the comfort, convenience and economy Frederick Stokers assure — it's a convincing argument ringing up sales for dealers all over the country!

BITUMINOUS AND ANTHRACITE STOKERS

Why not "get in" — and "cash in"? Liberal Dealer's Proposition explained on request; some good territories are still open.

The FREDERICK IRON & STEEL COMPANY
P.R.R. & Eighth Street
FREDERICK, MARYLAND
"Builders of Good Stokers for 20 Years"

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